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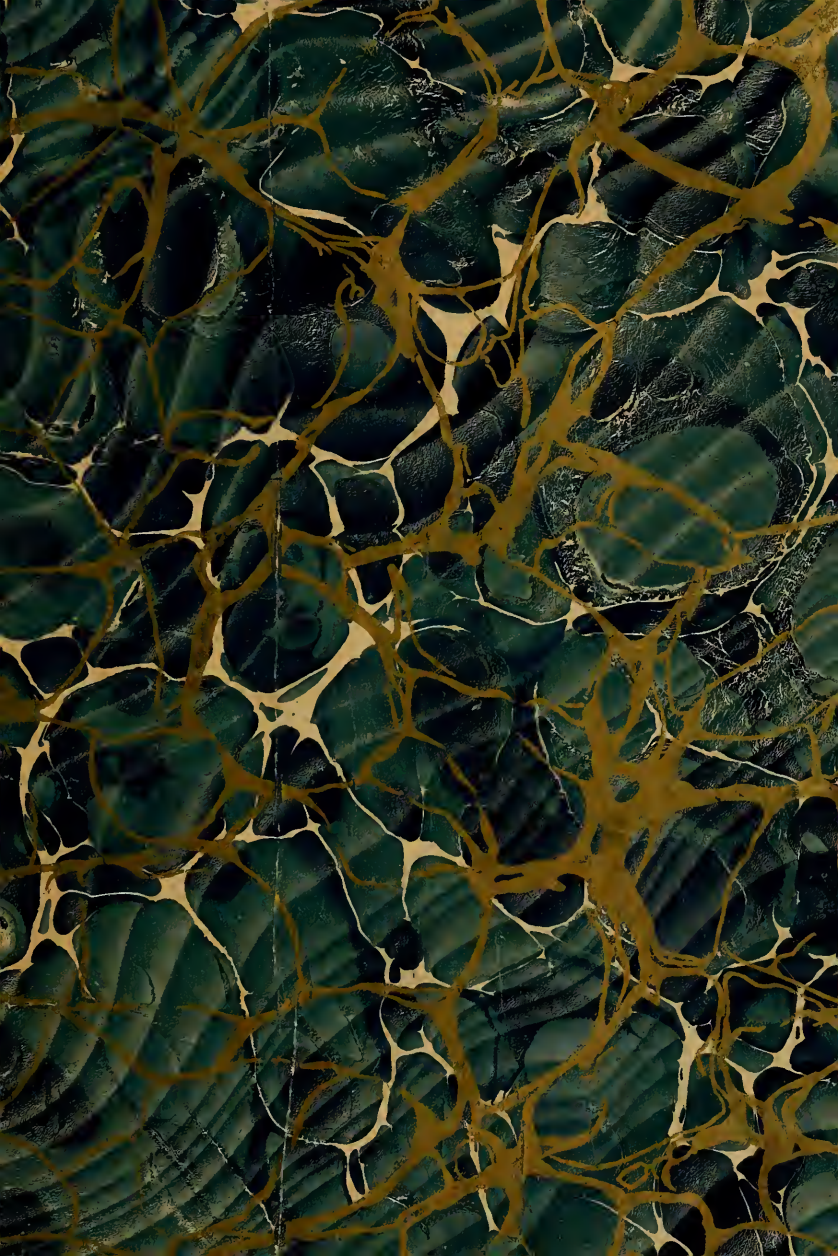

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MANUAL TRAINING MAGAZINE

EDITED BY
CHARLES A. BENNETT

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MANUAL TRAINING MAGAZINE

OCTOBER, 1901

HANDWORK IN THE PRIMARY SCHOOL.[1]

CHARLES R. RICHARDS,
Director of Manual Training Department, Teachers College, New York.

IF the title of this paper, suggested by our honorable president, were a little different, it would, in some ways, be easier to answer. If the question were, how early *should* handwork be made a part of school work, the only answer I can conceive is, "at the beginning." If there can be any question as to the place of handwork in the school, it seems to me that it must be as to its extension upward, but surely not as to how early it should be introduced.

Every consideration of child nature points to this answer. How can we raise such a question when we look at the natural child and see what an enormously important influence handwork plays in his mental development; when we see how in the very early years his knowledge of the material world is largely built up by muscular contact, and a little later how the chief expression of his crude, but vivid imagination finds vent in constant material and pictured creations?

How can we ask such a question when we recognize the important place of handwork in the kindergarten and acknowledge the significance of such work at this stage? Does child nature utterly change at the entrance to the primary school, or is the school instruction at this point to separate itself from natural education and to recognize only one side of child nature?

Surely both of these questions can have but one answer. We know that a large part of the mental life of the boy and girl of the primary school is still concerned with the gathering of impressions of the material world, and that it is the reflection of these impressions that fills

[1] A paper read before the General Session of the National Educational Association at Detroit, July 10, 1901 under the title, "How Early May Handwork Be Made a Part of School Work?"

the imagination and fixes the ideas of this period. We know also that these ideas and images tend to flow out in objective, tangible, and concrete creations; that this giving out is but a phase of the coming in — a natural and inevitable reaction that is part of the life-current; and further, if we put these facts together, and have come into any sympathetic knowledge of young boy and girl life, we realize that all this means that such creations are absolutely essential to the full expression of the mental life of the boys and girls of the primary-school age, and that, if we leave these out of the schoolroom, we are leaving out, at the same time, a large part of the life natural and essential to such children.

The problem of the elementary school today is, I conceive, to make the life of the school more real; more an epitome of the kind of thinking, feeling, and doing that obtains in real life; more a reflection of the actual life outside of the school walls.

If this be so, then all the natural elements of that life must be represented in the activities of the school. To attempt to reproduce real life for boys and girls of the primary school without the element of handwork would be like the play of *Hamlet* with Hamlet left out; it would be like the attempt to teach a boy to swim without letting him go into the water.

But handwork will not be a life-element in the school, unless it is used in a natural way. It will do comparatively little to make the school life more real, if it is conceived of as mere manipulation and used as a mere drill. Handwork, whether drawing, painting, modeling, or construction, as a natural feature in school work can never be a thing in itself. It is a part of a whole. Its different forms are simply means of putting thought and feeling into form and action. More than that, if the handwork is to be wholly worth while, the thought and feeling back of it must be genuine and worth while.

As the expression of natural motive and real thinking, on the part of the worker, handwork represents, with the pupil of the elementary school, one of the most natural and intense forms of living. In this relation it is one of the most effective agencies for developing both knowledge and capacities. In any other relation, its value as an element of school work must necessarily weaken and diminish.

Work of this character evidently cannot be a matter of blind copying of something placed before the pupil. If it is to be in any sense true self-expression, it must deal with undertakings, on the one hand, that represent real interests to the particular workers involved; and, on

the other, it must be prosecuted in such a way that the worker's own thought enters in some part into the result. Handwork of this kind by no means implies lack of care or faithfulness in its execution. On the contrary, it means the maximum of care and faithfulness, because it means the maximum of motive.

To bring the element of self-expression into handwork does not mean that we are to turn the pupil loose to exercise whim and fancy unrestrained. In handwork, no more than in any other form of school work, should the pupil be free from suggestion and guidance by the

ARAB ENCAMPMENT — FIRST GRADE.[1]

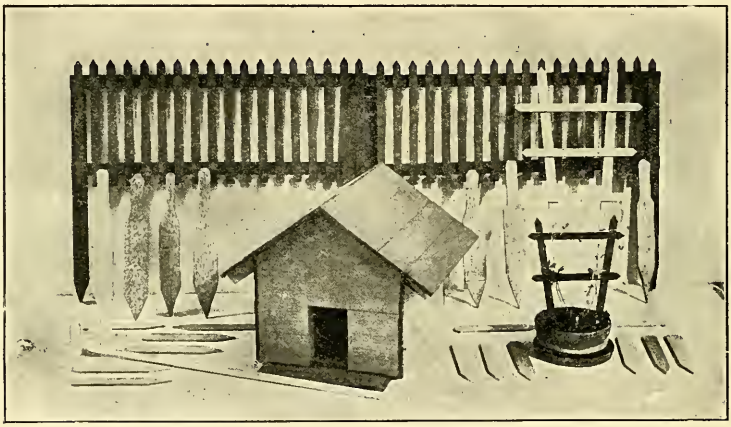
teacher. And, on the other hand, self-expression does not mean that the pupil is expected to develop the entire plan and design for each thing done. This would be too much to expect from the unformed standards of judgment of young children, and could result only in crude projects and unsatisfactory work. But recognition of this element *may* mean that the general plan to attain an end will be developed from the pupils. It may mean the adjusting and modifying of details within this general plan by the individual pupil; and it may mean the working out of ways and means to achieve this plan. It may mean these or many other things, but it should always mean that the worker's own thought and feeling are contributing in a real fashion to the end for which he is working.

When we take up the problem of handwork in this spirit, we are going to recognize that a nice sequence of difficulties in the work may be of less importance than the question of motive or the significance of a project to the real interests of the particular moment. Accuracy

[1] The illustrations in this article represent work of the pupils in the Horace Mann School of Teachers College, New York city.

and precision have commonly been referred to as the essential qualities of all educative handwork, but accuracy is natural only when its necessity is appreciated by the worker, and this will be the case only to the degree that the need for accuracy is perceived to be an inherent condition of success in the task and not as a quality imposed from without.

Such natural expression through handwork cannot take the form of set courses. It must be a matter of adaptation and relation to the life of each particular school. Both the in-school and out-of-school



IMPLEMENTS FOR THE GARDEN — FIRST AND SECOND GRADES.

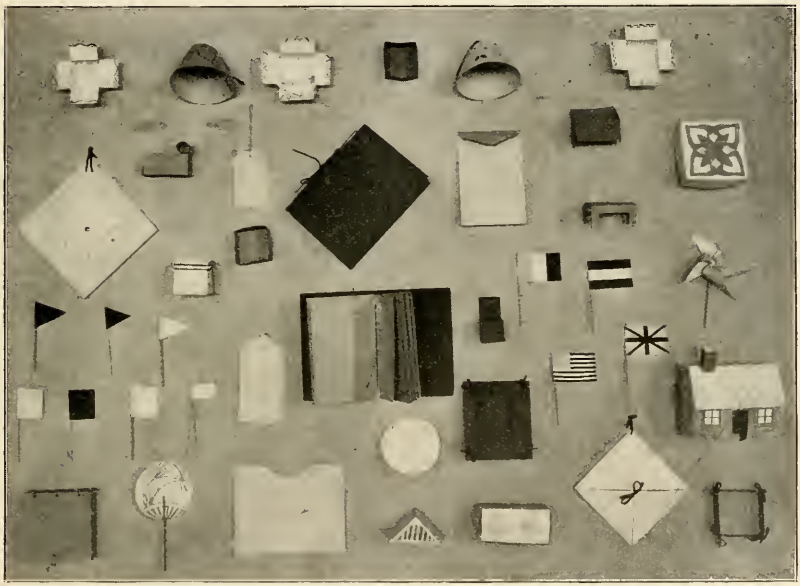
interests of the particular children dealt with must form the basis for such work. This means infinite variety and flexibility. Handwork of such a kind will take as many forms as there are classes to be taught and teachers to teach them.

In relation to the school interests, or more specifically to the course of study, handwork represents emphatically a method rather than subject-matter of instruction; and it is in this sense that such work finds its most natural place in the lower grades.

No catalogue of the possibilities, in this direction, need be given; painting, drawing, modeling, and construction, singly or in combination, all contribute their special assistance to enlarge and vivify the conceptions brought out in the various subjects of the curriculum. Where the imaginative and personal quality is predominant, as in the story form, painting, drawing, and clay work have their special value; where material facts and conditions of life are dealt with, as in the study of primitive life and the beginnings of history, opportunities are

found in the reproduction of typical forms of shelter, implements, and inventions; where the relations of human life to the physical environment is the theme, as in nature study and geography, abundant opportunity for the study of occupations is possible both through pictorial and constructive representation and the practice of typical operations.

With the young child, the tendency to reproduce the actual or the imaged environment assumes different forms at different stages of



PAPER CONSTRUCTION—FIRST THREE GRADES.

growth. Two phases seem to be always present, but in varying degree. With the very young child this instinctive tendency is largely satisfied with mere representation, either pictorial or constructive; but as the experience enlarges and the powers of perception develop, the interest in and the desire for reality increases, and this can be satisfied only by the achievement of things of practical service and use. Both of these tendencies are present throughout the school period; they are, indeed, but two phases of the same tendency, and the one blends insensibly into the other.

It is true, however, that the representative phase is particularly strong with the pupil of the early grades, and that through this channel occur many of the most natural opportunities for relating handwork

to the activities of the school. Such representation on the part of pupils of the primary grades may sometimes seem too crude and fanciful to have a disciplinary value, but we should remember that such concrete suggestions serve as necessary centers for the play of the childish imagination, and that through them life finds real expression and fulfilment. It would be, of course, most unnatural to expect great perfection in the natural expressions of seven- and eight-year-old pupils. Truth of expression is the important thing, and great accuracy of result is not truth of expression with the pupil of the early grades.

TOURNAMENT AT KING ARTHUR'S COURT.

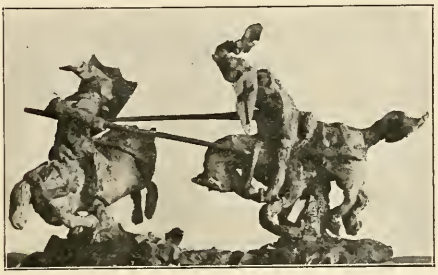
It is on this side of representation that drawing, painting, and clay-modeling have their natural opportunities. Representation through these media may be either a record of fact, as the picture of a flower, tree, or animal form, or it may be an expression of an imaginative picture brought up by the reading of story or history. Constructive representation, which approaches nearest to reality, has also an important place here, and constructions ranging from a simple miniature house in paper to elaborate scenes with numerous details illustrating some phase of life or industry all suggest the varied possibilities in this field.

This last type of work, in which the whole or part of a class unites upon a common project, represents an important possibility in this direction. The value of such work is twofold: on the one hand, it introduces the healthiest and most practical kind of co-operation into the school, and, on the other, it allows of larger and more important undertakings than are possible in individual projects.

With large classes such work presents some severe problems, and it

cannot perhaps be carried very far in public-school conditions; but the great vividness of such representations to children and the fine experience involved in their making are certainly worth going far to attain, and it would seem as if a small amount of such work might be attempted under even the most restricted conditions.

In these first years, this phase of constructive representation goes far toward satisfying the pupil's instinct for concrete expression, and indeed persists as a natural form of expression for a long time; but from the first interest in and demand for reality are increasing, and, as the pupil grows older, the things made must approach nearer and nearer to the actual fact. Thus the making of paper furniture for a small house means much to the pupil of the first grade, but is no longer satisfying to the boy of the fourth grade.



KNIGHTS IN COMBAT.

Representation through construction continues to have its place, however, in the upper grades of the school, but its possibilities become more and more limited to things that possess large meaning and imaginative significance, such as the log or block house of the early settlers in connection with the study of colonial history, or a model of a classic temple at the time of the study of Greek history.

All through such work the important point to be scrutinized is whether the particular project is worth while to the young worker. Is it something adequate and satisfying to his desire for concrete expression? Is it a thing that enlists true motive in its fulfilment? As the power of visual imagination increases, concrete expression plays a less and less necessary part, and its value is confined more and more to special interests. Constructive representation remains natural only as long as it serves to express a significant fact more satisfactorily than other media. When this ceases to be the case, other channels of expression become more natural and more worth the attention of the school.

Such work as has been suggested means flexibility. There can be no course or so-called "system" for such work. It means simply the bringing in of another expression element into the work of the school, a giving-out side added to the taking-in side.

But the school interests as represented by the curriculum of today

are not all. Handwork expression touches all the interests of young life, and the out-of-school interests should find a place in any generous scheme of such work. The school interests, to an extent, deal with general ideas, but the out-of-school interests mean the personal and the immediate. Where representation may be largely relied on to express the school interests, the directly useful is necessary to meet the other. And, on this side, the demand for reality and practical achievement that exists from the first finds its opportunity and fulfilment.

And here also there should be infinite variety. If we are to deal at all with these out-of-school interests and not delude ourselves as to the question of motive in the work, we must find what are the true interests of the particular children we are dealing with. No single scheme of work can apply to all conditions. There must be some kinds of work for the city and others for the country; some for the school in the tenement districts and some for those in the precincts of the wealthy; some kinds for the towns of the sea coast and others for those of the interior.

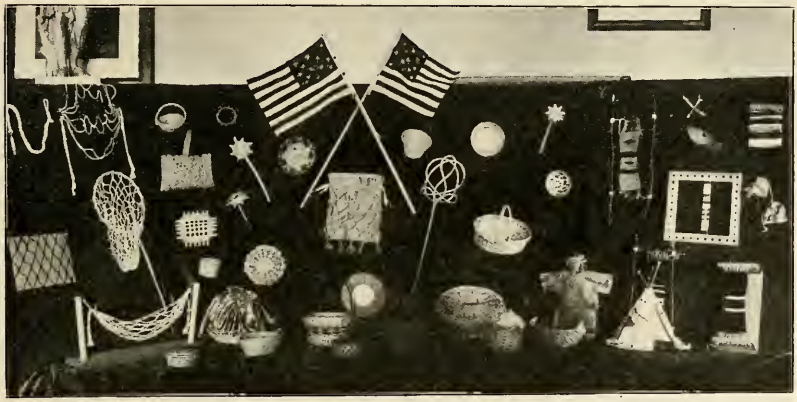
We must put by the delusion that any one course of work can reach the real interests and stimulate the energies of all classes of children. With the pupil of the primary school, as indeed with the pupil of the grammar school, if we are to appeal to the idea of use and expect to find in this idea a real motive, a real incentive, it must be a real use that we offer, not one pictured simply in the teacher's mind. It must be a use that has a real meaning to the individual worker and one that builds upon the actual conditions of his life.

Another quality that demands consideration in this work, as a whole, is the need of variety in our materials and processes. If we consider all our work but as the expression of some real interest of the worker, this matter will take care of itself, for we shall soon see, if we study the range of a child's interests, that they cannot be confined within the possibility of any one material or one process, but that they touch the whole field of his surroundings.

Construction in paper and cardboard is extremely practical and valuable, but work in this medium is only of one kind. Accuracy, symmetry, and regularity are its characteristics, but freedom of expression is wanting. Other kinds of work that represent other elements, such as freedom, grace, and flexibility, are just as valuable and should be a part of the handwork experience. Such elements are found first of all in clay-modeling, and then in raffia and basketry, simple weaving, sewing, and in bent-iron work. On the other hand, no one kind

of work or material is broad enough in its possibilities to adequately express, even in a meager way, the varied interests of school and out-of-school life, of boy and of girl nature.

All the practicable and typical constructive processes contribute a share, but only when we draw freely upon the different elements and use one thing and another, alone or in combination, as is most suitable for our special purpose, shall we reach the natural use of handwork in the school. It is not here a matter of training in any special process, it is a question of using the resources of handwork in the service of the school.



BASKETRY, WEAVING, SEWING, AND CORDWORK — FIRST FOUR GRADES.

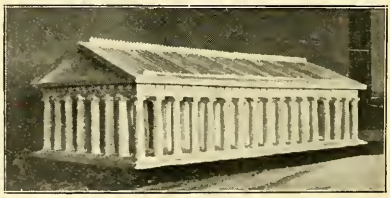
Reference has thus far been made solely to the relation of handwork to the nature of the child, but there is another side that the school has to consider, viz., its relation to social life. On the side of the pupil, handwork is a medium of expression in terms of form, color, and material; in its relation to social life, it is essentially a means of interpreting art and industry. It is the active agent by which the pupil is brought into contact with typical phenomena of these great fields of human activity. The full interpretation of these features of social life by the school is a task, indeed, that cannot be borne solely by handwork. That, I take it, is to be fully comprehended only through the gradual readjustment of the curriculum, as a whole, in response to the needs of modern life. The main burden of this task, however, must fall upon actual work with the hands, and this fact should naturally have a bearing upon the selection and organization of material.

In the lower grades, or, for that matter, in any place in the school, the differentiation of either art or industry cannot be carried very far. Only the fundamental activities that concern the very structure of social life can be studied, and these only in their elements. The essential problem in this direction, apparently, is to trace the evolution of food, clothing, and shelter from their simplest beginnings to some understanding of their meaning in relation to the civilization of today.

BLOCKHOUSE, BRIDGE, AND GAME—FOURTH, FIFTH, AND SIXTH GRADES.

This meaning of handwork is by no means opposed to its use as an expression medium; for it is precisely along these channels of social activity, these large interests of the actual world, that the deep instincts of the child issue, and in which he finds his natural desire for power and capacity. These two relations of handwork are, indeed, but two phases of the same problem. One of them sheds light upon the method of instruction; the other points to the general character of subject-matter.

The problems of practicability and expense are, of course, vastly important ones in regard to this work. All of the above kinds of work entail practical difficulties of one kind or another in the handling of material and in the operation in the regular class-room. And yet the difficulties involved are only material ones—the child stands ready and eager to seize upon these activities and reap incalculable benefit from them when the way is opened. Can we conceive that the way will not be opened, and that the practical resourcefulness of the American teacher, when she is convinced of the necessity of these agencies, will not find ways and means to master this problem and bring to bear all these natural resources upon the life of the schoolroom?



TEMPLE CONSTRUCTED OF PLASTER—DETAILS CAST AND ASSEMBLED BY FIFTH GRADE.

The real problem, indeed, at the bottom of this whole question is presented by the grade teacher, for all considerations, economic and pedagogic, emphasize the necessity that whatever of handwork is done

in the primary school must be done by her. Even if it were economically possible to consider any other arrangement, it would be pedagogically out of the question. Only the regular teacher can bring the handwork into harmonious relations to the school life and use it as a true medium of expression of the other school work.

Herein are at once both the difficulty and the hope of the situation. Difficulty because the grade teacher has commonly not had any special training in handwork, and, even when convinced of its value, is apt to regard the whole proposition with diffidence and even dismay. This feeling, I firmly believe, is really a lack of confidence rather than any lack of capacity to deal with the simple processes that are needed. It is because such work has not been a natural element in the experience of teachers, and not because of any inherent difficulty in its requirements. The diffidence at undertaking work of this character will, I feel sure, largely disappear, when we do away with our set courses that appear so formidable and seem to need so much technical training, and take up the work in the spirit of natural use; when we substitute for the idea of teaching handwork the idea of teaching through handwork.

When handwork is taken up in this spirit, it ceases to be a thing apart. It is no longer simply so much more work added to an already crowded curriculum, but a helpmeet and assistance in dealing with the constant problems of the school.

On the other hand, it will be only when the work is approached in this spirit, and the regular teacher comes to use handwork expression in the same way that she now uses speech and writing, that handwork will reach its full possibilities in the primary school, or for that matter in any other stage of school work. When this work is assimilated in the primary school and there brought into organic relations with the school life, it will not be long before its proper function will be understood by all teachers, and the day will have passed by when manual training is thought of as a little work with tools in a room apart from and divorced from all the other interests of the school.

When this time comes and manual training shall be reaching out to serve all the natural and varied interests of school life, then and then only will handwork come into its full educational inheritance, and then and then only will it find its full possibilities as one of the most powerful, because one of the most natural, expressions of child life. I believe that this time will come. It will come, of course, but gradually and perhaps slowly, but as it comes we shall find ourselves coming into a new era of manual training; an era when this work will be brought out from its isolation and made an organic instrument of all school work, understood and respected by all teachers as an essential element in the education of children.

TEXTILE ARTS AS CONSTRUCTIVE WORK IN THE ELEMENTARY SCHOOL.[1]

CLARA ISABEL MITCHELL,
Teacher of Textile Arts, School of Education, University of Chicago.

TO PRESENT the subject of textile arts as constructive work, I shall, with your permission, discuss constructive work generally, and its place in the curriculum, perhaps gaining by that means a clearer point of view from which to study the value of this particular activity.

As the educational problem is now shaped, the most economical measure for a body of teachers to pursue is the free and critical discussion of the course of study. The discussion of that question by this particular company is of vital importance, because upon the grade teachers, manual-training teachers, and art teachers rests the responsibility of the initial act in reconstructing our course of study.

The present course of study is, evidently enough, not adequate to the demands of the time. Our educational ideas are undergoing radical changes; our course of study does not meet these changes. We need one which acknowledges the claims of the new ideals and assists in their realization.

The educational ideal is changed over from "school as preparation for the future" to "school as present community life." It insists that school *is* life; that it is the place where every child begins at once to realize himself according to his own innate capabilities.

To meet the requirements of this ideal, the course of study must recognize school as community life and must provide for its organization and maintenance as such. By community life we mean that state of society in which every individual member orders his conduct with reference to the good of the whole; the whole being so constituted as to necessitate the highest development of its members. As this state of society is the only means powerful or complete enough to set in motion all forces of individuals, it is evident that individual progress is possible only as community life exists, and that the good of one is identical with the advancement of all.

Our school, in fulfilling this large social aim, must give to children all-sided growth as a result of their service to the community. It must

[1] Read at joint meeting of the Manual Training and Art Education Departments of the National Educational Association at Detroit, Michigan, July 10, 1901.

insure to them the development of all powers, physical, mental, and moral. As all education is through self-activity, and human faculties develop through use, the community which is to provide for all-sided growth of individuals must call into action all the forces of those individuals.

Community life is made up of work and play; it depends upon these activities for its existence. The individual is developed through this work and play. It is, therefore, the function of the course of study to so plan the school community as to engage all its members in educative work and play. Such work and play, socialized and constructive, we call social occupations, and in their organization lies the problem of the course of study.

Constructive work, manual training, industrial arts, drawing, painting — handwork of all kinds, by whatever name — form a large part of these social occupations of the school life. The question is as to their place and educative value. Psychology as well as experience proves them to be among the central interests of young life, the strongest forces in the schoolroom, the most economical means to power and knowledge. Grouped together with other social occupations, they should be the center of the course of study, and about them should be ranged all the other subjects of the curriculum.

The fitness of social occupations to stand as the central force in education is proved by history. The social life of our great world is seen to consist in the interrelation and development of a few primary and fundamental activities. Cities, farms, mines, quarries, and waterways are filled with men and women busy with the affairs of life — engaged in the work and play of the world.

All this work and play is for the satisfaction of man's needs. His necessities, reduced to simplest terms, are companionship, shelter, clothing, and food. The needs of society today, complicated as they seem, arise from these few fundamental ones, and are the elaborations of them — developed and refined by man's educated taste and increased subtlety.

Through self-activity, under the necessity of food, clothing, shelter, and companionship, the human race has educated itself out of savagery into civilization. In the getting and cooking of food, making of houses, weaving of clothing, and adjusting himself to the habits of other human beings, man has gained the knowledge of nature and society, and grown to the power of self-direction, which constitute his present state of culture. The fundamental needs of his nature have put

him in contact with other people, with materials, forces, laws, and localities which have brought to him great bodies of knowledge. This knowledge he has classified into sciences, mathematics, history, law, and philosophy.

His activities, set in motion under the pressure of necessity, have developed and multiplied with use. The rude strength of the primeval hunters, fishers, farmers, and shepherds has grown, with experience, into the skill and art of our civilization.

This has been the educational process through which the race has passed — *self-activity aroused by need.* The result is our present state of society with its sum of knowledge and stored-up power; knowledge organized into sciences, mathematics, history, civil law, philosophy; power expressing itself as skill in the arts of living — agriculture, manufacturing, commerce, social government, language, literature, and the fine arts.

Our human family has educated its children through centuries of building, cooking, weaving, family life, and law-making; in processes at first simple and primitive, but growing in complexity as the race advanced. As there arose necessity for bridges and machines, people became engineers; seeing the need of better and more beautiful homes, they became architects and artists; conscious of still higher needs, they devoted themselves to the study of sciences, religion, law, government. Sense of social needs has, from the beginning, acted as the most powerful incentive to individual human effort.

The school must apply the principle of education learned from the great world. It must be a community into which the child puts himself in work and play, and from which he gains the knowledge and power which are his individual right. Like the large world, it must demand of its members work which sets in motion all their latent energies, and puts them in contact with people, materials, forces, and laws. As the race has gained its learning and skill, the child will get his — by working out the problems of life through the incentive of human need.

Representative forms of the great type industries appear in the school under the names of constructive work, manual training, industrial arts. The processes they involve are wood-working, metal-working, cooking, gardening, weaving and needle-work, pottery, modeling, drawing and painting, bookbinding, and printing. Heretofore these have been superadded to the already overcrowded curriculum, as valued but unrelated subjects. The time has come when, if they are to

fulfil their great educative function, the course of study must recognize their social significance and establish them as fundamental factors in the life of the school. Socialized work has been the maker, builder, educator of our race. It must be such to the children of the race. It is for the course of study to plan work and play that will place the children in the normal, vital relations with life — in free and living contact with nature on the one hand, on the other with society.

To allow for this normal interaction between the child, his work, society, and nature, four conditions are essential to the planning of all constructive work in school:

1. Everything made must be made for the sake of its social value.

2. The need for the thing to be made must appear to the maker and must be recognized by him as genuine.

3. The work and play must be so varied and universal as to make an all-sided appeal to the child's nature.

4. It must be so directed as to connect the worker with nature and with human life as sources of knowledge.

The first condition — that all work done shall have social value — is so bound up with the second — that the child shall know and appreciate the value — that the two must be considered together. Both are essential to community life, in accordance with its definition as a state of society in which the individual orders his action with reference to the good of the whole; for the workman can direct his powers only toward such ends as he sees and understands. He puts his intelligence into his work, just in so far as the work appeals to his intelligence. He who knows the purpose of his labor can focus his attention upon it, measure his forces in relation to it, and shape conditions toward its fulfilment. That the student should know the use of what he is making is essential to his education as a freeman — a socialized human being.

Originality, freedom, taste, can grow only under power of initiative. To know a need, and to be allowed initiative as to ways and means of filling it, gives opportunity for play of the creative element, without which work will be imitative and slavish — not truly constructive, because the worker has not put himself into it. The putting of himself — his taste, his invention — into his service makes it a genuine offering to society. It is just that which makes it social — community living.

Work done in the textile arts, as in all other forms of handwork, should be the making of things of use for the school, the home, some

other school or home, for people somewhere in the world. Enough human needs are waiting to engage our energies at all times. The necessity for laws restraining child labor proves that the work of little children is of value to society. The children, then, may be set at the simplest beginnings of the great industry which ends in clothing the human race and in beautifying human homes. Let them weave baskets, make rugs, embroider aprons and curtains, and sew garments because people need their work. Such making will be the education that will lead into original, creative skill.

Let them know the use of each thing they are making and appreciate its value, for sense of value is interest. Interest, the great motor force in human action, makes effort easy. Interest in spinning, dyeing, designing, sewing, and embroidering of things for use will open new channels for the movement of activities outward — the freeing of creative energies.

The third condition necessary to the socialization of constructive work is that it be of sufficient variety and breadth to call into action all of the child's powers, and so give him all-sided development. The power of community life as an educative force lies in the fact that its needs are so many and so varied that no individual, however abnormal or undeveloped, can escape the appeal of all of its claims. Somewhere in the work demanded by the maintenance of society is the particular need which will put into action the individual energy. And everywhere in it is that call to disinterested, unselfish action which alone develops the highest and most potent force in man's life, viz., consideration of his fellows.

When the course of study shall make of the school a place of playrooms, workshops, studios, gardens, kitchens, and laboratories where children are co-operating in a real though small part of the world's work, every child can find that activity through which he may begin to realize himself. Somewhere there will be the piece of work which is to set him to thinking, feeling, doing. Then the thing he does is the expression of himself. Into it he puts his thought, feeling, skill.

It is at this living point of self-expression that human growth takes place, and that education is possible. Here the teacher recognizes his opportunity. Work in the shops, studios, and laboratories, made powerful through purpose, self-directed, moves outward and manifests itself in a rug, a chair, a piece of pottery — a thing of use. This is art. It is a gift to society, expressing the thought and feeling of the maker. Art is developed, skill grows, under the demand for creative

work and through incentive to self-expression. In complete community life this demand and this incentive exist.

The course of study must provide for the use of material, and employment of processes so varied as to make possible full expression of all sides of the self in art. When our school life sets children to work in designing and making happily the things used in daily life, making them beautiful that they may the better serve human needs, it will give them art education — education into art for all the people, by all the people.

The final condition for constructive work is that it shall have such direction as to connect the worker with all of life — nature and society as the sources of knowledge. Fitness for community life asks that its individuals have knowledge to contribute to the general good. We have seen that the sole sum of human knowledge has been generalized into great bodies of facts. It is for the course of study to plan types of industries in the school which will direct the children toward this knowledge and give them the power of comprehending its meaning and its use.

Things made in the textile arts, for example, must be so closely related to the necessities of the child's life that his interest in the things themselves, extending to the materials of which they are made, and the processes by which they were produced, directs him toward the facts which explain those materials and processes. Desire to fill completely the needs for which the fabrics are woven must lead him to consideration of the fabrics and fibers. It should move him to study of qualities; of causes for success and failure in culture. He must feel the community so genuinely dependent upon the excellence of his work that he willingly investigates processes; he invents; inquires into laws and forces to apply to the improvement of his art or craft. Thus he will become a self-propelled investigator in the field of science and a contributor to the sum of knowledge in applied science.

The materials used in these arts are so varied in their qualities and suggestiveness that they set the worker wandering through all the world of nature in search for the meaning of their charm and color and design. His own experience in dyeing fabrics should lead him into delighted appreciation, to the coloration, of sky, water, flower, fruit, bird, and insect. These are but a few hints at the vital connections between nature (or the sciences) and work in the textile arts. It is sufficient, however, to indicate the closeness of relationship existing between all forms of social occupations and the natural sciences.

The course of study must establish these relationships in school, through organic correlation of subject-matter. The facts of science should come into the child's life as they came into the life of the race —that is, when needed for immediate use. Not by the page, by the book, nor by the subject; but principle by principle, as it can be applied to daily life. To illustrate, let knowledge of physics come to him as he constructs looms, runs the sewing machine by steam, or rings the door-bell by electricity. Let him learn chemistry in dyeing, in cooking, in testing of building materials; botany and meteorology in his garden.

As to the correctness of the pedagogical method involved in this we may be sure. If the facts of science are to have value and force to a student's mind, they must fit the problems of his individual life. They cannot be brought to him as possible helps for the future. They must be sought by him as necessary to the movement of his work and play. Knowledge gained in this way will have clearness and meaning. It will be full and vital, because life itself is greater than any school and more potent than any text-books. Under such a plan, history will be to the child the story of how other people have done work like that which he is doing. Interest in his own building, weaving, and cooking will give him interest in the building, weaving, and cooking done by people of all times. If, while weaving a rug, he reads the story of man's struggle for clothing from the beginning, he learns to see in that struggle a great part of the history of man. And he is able to interpret that history, because in his own person, through the work of his own hands, he has partaken of the experience of the race. Struggle with the world's work, however elementary, puts a human being into intelligent relationship with all the workers of the world, past and present, giving him insight into history and sociology which, reinforced by observation and study, is scholarship of social value.

Contact with materials of all kinds, study of qualities, interest in work and workers, build up in the child's mind great images of the earth and its products. Tracing the course of silk from China or Italy, woods from the tropics, metals from Siberia or the Rockies, dyes from the Mediterranean or the depths of the coal bed, the child learns to picture the earth as the rich source of materials, the background of man's life, the scene of his activities. Geography becomes the science which explains to him much of man's history, his work, and civilization.

So the subject-matter of the sciences, history, sociology, and

geography correlate with, not only one art, but all forms of social occupation, and on such a basis should they have their place in the curriculum.

To recapitulate, the new ideal of education demands the reconstruction of the course of study. It makes social occupations the center of correlation. About these occupations it groups all sciences, mathematics, geography, history, literature, and language, as helps to the child's better understanding of this work and its relation to life.

Handwork, which is a large part of these occupations, must fill four conditions: (1) Everything made in the school shall have distinct social value. (2) The child in making any object must appreciate the social need which that object is to fill, thus rendering willing and intelligent service. (3) The handwork must be so varied as to call into activity all the faculties of the children. (4) It must be correlated with such studies in the sciences, history, geography, mathematics, as will give the children increasing knowledge of the work they are doing and a growing insight into its scientific and social significance.

Teachers of handwork, in conjunction with grade teachers, can do most to bring about this reconstruction by establishing the different forms of handwork as social occupations and bringing all the subjects into relation with them. The most radical change involved in the reforming of the course of study will be the correlation of the sciences, mathematics, history, sociology, literature, and the languages, with the school occupations. To accomplish this, expert knowledge in different branches of subject-matter must be brought to bear. When, with its aid, the school shall be a center of productive social activities leading outward to all sources of knowledge, we shall have an education worthy of our ideal.

In such a life our children will be happy co-operators in the work of the world. Its occupations will unite them in the brotherhood of community interest, take them closer to all workers and builders past and present, and direct them toward nature as the source of all knowledge and good. When, through the co-ordinated working of mind and body, the children of men have learned to help each other in making the earth a garden; in building cities which shall be the beautiful dwelling places of men; when they have become generous and skilled in fitly clothing all of the children of the race, the world will have a great new art. One product of that art will be the beauty added to the external world of man's building; the other will be the greater beauty wrought in the spirit of the builders — wrought into the quality of human life itself — and surely that is the end of all construction.

HOUSEHOLD OCCUPATIONS IN PRIMARY GRADES.

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SOME general principles of selection of subject-matter (including "methods" in this term) for primary grades must of course be agreed upon before any discussion of the adaptability of any particular form of occupational school work for small children can proceed. In a number of cases a tendency has been shown to use subject-matter that is more or less social and continuous with the youngest children in the kindergartens and so-called connecting classes. It seems strange that Froebel's great idea of the educative function of occupational plays used in the kindergarten did not effect, following its natural development, a rational change in the work of the primary grades. But traditional psychology, with its reflection in the ideal of a body of facts and mastery of the symbols of communication as the true content of education, held its own against the newer thought.

The basis for the present changes in subject-matter must be found in the newer psychology. One of the best illustrations of the change in the attitude of mind due to the influence of the newer psychologists may be found by contrasting a course of study such as that issued by the public schools of Boston with examples from progressive school systems like those of San Francisco or of Stockton, Cal. Nothing could better set forth the rocky barrenness of the old curriculum as contrasted with a conservative combination of old aims and new ideals.

The differences in ideals governing the choice of subject-matter are based upon three changes in psychological conceptions of mind, which may be very briefly stated thus: first, the recognition that, as Dr. John Dewey says,[1] "mind is a social rather than an individual affair — that social needs and aims have been most potent in developing it;" second, the idea that intellect or knowledge has, in Mr. William James's words, "but one essential function, the function of defining the direction which our activity, immediate or remote, shall take;" and last, "that the growth of mind is progressive" — "that at different stages the mind has different interests and capacities."[2]

A general statement of this effect of psychology upon educational

[1] *Elementary School Record*, No. 9. [2] *Ibid.*

ideals may be found in the following formulation by Mr. Alfred Lloyd: "Not history, of whatever events, nor yet science, of whatever branch, but the application to self, is what makes for true culture, and at the present time the ideal in education seems to be to encourage such studies in any individual case as will insure application."[1]

The problem seems to be to make such selection of educational material or subject-matter as shall keep the child's school life in vital connection with the social life about him and lead him to make application of his increasing knowledge in his own activities.

The continuity of out-of-school life and school life is so evidently maintained in the choice of typical occupations that from this point of view their value seems obvious.

But something of exceptional value is also gained through the continuity obtained in occupations ever necessary and ever present in experience which by means of their social interest carry the child through more or less monotonous labor, thus gaining at last the true incentive to work, the pleasure of the accomplished task.

The danger of appealing to mere sensational and fugitive interests is so minimized through the nature of the material, and the necessity of social organization in even the simplest forms is so obvious, that even the most unconscious teacher will blindly use some of these opportunities, while to a teacher in search of them the choice is only limited by the ever-present need of adjustment to the varying capacities of her pupils. That such material does appeal to children I can safely leave to the reader's experience. Quoting in support of the choice of such direct and immediate activities for children of the primary grades Mr. Dewey's description of the first part of this period:

> The first stage (found in the child of, say, from four to eight years of age) is characterized by directness of social and personal interests, and by directness and promptness of relationship between impressions, ideas, and activities. The demand for a motor outlet is urgent and immediate.[2]

One of the strongest points for the use of social occupations, particularly household occupations, for school work is that they are still a part of every teacher's experience, or, if not, can become so with but little effort. The material needed is everywhere available. The problem's chief difficulty, the large number in a class, has been met in other forms of active work by the group recitation system. Every successful primary teacher now works to some extent with groups of ten to twelve children at a time. To use this same method with

[1] A. H. LLOYD, *Citizenship and Salvation.* [2] *Elementary School Record*, No. 9.

social occupations such as housekeeping should be a natural step. The amount done is of course sadly lessened, as in everything else, by the necessary repetition of the same work in a class of from twenty-five to thirty-five, while the rest are occupied with so-called seat-work, so that without most skilful planning much time is wasted. But the gain to all the school work in motive and meaning will more than compensate for this loss.

The question next arises: How shall these occupations be applied in primary work? The answers are as various in detail as the situations to be met, and in the end depend, as everything else in the curriculum does, upon individual initiative.

In the absence of any definite limit to the term "primary grades" I have taken the first four grades, covering the ages from about six to ten or eleven years. As requested, I shall limit my illustrations to occupations concerned directly with the preparation of food. The processes here concerned are easily simplified for school use, and in the present empirical state of knowledge hardly afford much opportunity for use in the later stages of education. That a selection can be made from household occupations which will furnish social and organized material for school work in primary grades, I hope to show, and shall lay more stress on the social value of this work because Mr. Richards, in his preceding article, has shown the general educational relation of organized activities to mental growth.

In all formulations of the value of nature study for primary children one finds repeated the necessity of confining the "lessons" to simple facts and relations along with the aims "to cultivate the powers of clear thinking and careful observation, in order to grasp the simple relations involved." Can the ideal of "cultivating a scientific love of truth" be conceived as appealing to a small child? As a matter of fact, as Dr. John Coulter has observed, "I should be thankful if a child's natural powers of observation were let alone to develop, as they do when not inhibited." Anyone having an ordinary acquaintance with young children knows that they see much more than the ordinary, preoccupied, adult. The things a child sees are, of course, the things that are doing, and those natural objects which suggest use or action to him. His curiosity is naturally excited by unknown materials, hence he sees what escapes others as familiar. The relations he grasps are not the intellectual abstractions of the scheming teacher, but the use primarily to himself or someone else, or later to the plant or animal itself.

To satisfy this interest, and gradually to bring the child through the natural training involved in the first fruit of his observations into social occupations, will not only preserve the original ability to see, but direct it into lines profitable to the socially developing self.

While no one would fail to recognize the value of such nature study as increases the child's understanding of, and sympathy with, animate and inanimate nature through excursions and care of animals and plants in the school, yet there seems to be danger of this kind of nature study becoming a mere addition to the other subjects of the primary curriculum as long as the motives appealed to are adult in character. As long as the ideals are far removed from action, as are those generally formulated, the tendency to insist on accurate observation of relations and parts having no real meaning to the child will persist.

With the appreciation, however, of the facts of the child's progressive growth, of the dangers of a divorce between intellect and conduct, and of the great part which social life there plays in the individual's development, must come an application of these aims to the choice of more social occupational work for children.

The most obvious place in the present school curriculum, nevertheless, for the use of household occupations as an entering wedge for general social occupations is to be found under nature study, where scattered and perfunctory "plant lessons" can find a natural center in the school garden. Where schoolyard gardens are an impossibility, schoolroom boxes are not. Where a complete kitchen equipment is an impossibility, there are effective substitutes which will pave the way to the social end — the class luncheon. The importance of making the cooking, or whatever process is carried out by the children, serve some end desirable to the child is not often appreciated. Most persons overlook the need for a sufficient motive which appeals to social interest and involves co-operation as well as a recognition of individuals by the social whole. The simplest process which makes something that can be enjoyed by all is complete only when, by keeping the number small at a table (ten, or better, eight children), the children themselves can carry out completely the serving of a social meal. Implying, as this does, the cultivation of social amenities and exercise of hospitality, the school then uses one of the strongest of childish motives. The substitutes for the ordinary kitchen equipment are many and various. The two most essential ways of cooking — boiling and baking — can be carried on with two gas or kerosene stoves, using large tin pans as the

water reservoirs and small tin cans as the children's individual boilers. Mr. Edward Atkinson has an article in the *New England Kitchen Magazine*, entitled "Every Boy His Own Cook," which gives directions for the construction of an oven practicable for any schoolroom. Boards and saw horses make practical cooking and dining tables to be placed in the temporary kitchen, screened from the rest of the schoolroom.

Where it seems impossible to use even the most primitive cooking apparatus, such processes as the making of butter, flour, and maple sugar, when performed with the social setting of the occupation typified, may well take the place of the simple cooking processes. As an illustration of one of these processes arranged to present only one or two unknown conditions for the children to meet, the butter-making carried out by twelve little second-grade children who a week previous did not know whence butter came, might be given. The planning of the churning occupied about half an hour a day for a week. About an hour more was needed for the making of the wrappers and dashers. The children gathered together the materials necessary, *i. e.*, they planned what would be needed — churns, baking-powder cans, dashers, wooden sticks, paddles for working the butter, salt, and cheese-cloth and paraffin paper wrappers. In each case, as soon as the children formulated a need and suggested something to meet it, the material best fitted to the need was given them. Under other circumstances more could safely be left to the children. The cream, at the right temperature, was given to the class, and the process was completed in one period of between forty-five and sixty minutes in length.

All conditions of children find a wide field in the use of household occupations, such processes being suggested by the experiences of every home. The particular adaptation made would, of course, depend upon the locality and the experience of the children. In city schools it would be worth while to carry on the simplest processes of food preparation as well as cooking. For example, to dig a real hill of potatoes, to sort, to measure, and save some for seed, and finally to cook others, would certainly be a new and valuable experience for city children. With country children the valuable points would differ widely. The manner of growth of the potato as compared with other underground stems, the action of heat on the cellulose and starch of the potato, the relation of potato starch to other forms of starch, the value to the plant of such storehouses of food, the care necessary in storing and selecting seed, could all be brought out, whereas such

points treated experimentally could be used to advantage only with much older city children.

Those occupations most closely concerned with the everyday home and neighborhood life, which can be so simplified that the child can carry out the processes involved in a short time and with the greatest independence, would naturally be chosen first. The choice for the first two grades would also fall upon such processes as are often repeated and completed in short intervals of time.

When a child carries out processes which he has seen almost daily, he is free to initiate changes in the methods which will enable him to attain his end. The more familiar household activities would, with this basis of choice, naturally precede such occupations as textiles, pottery, metal-working, etc. However, household activities, especially the preparation of food, can be so treated as to hold the attention and afford educational opportunities in the transition stage of the child's development which begins about the time the third grade is reached. This second or transition stage of the elementary period is marked by the beginning of definite consciousness of processes as distinct from ends, and hence ends more remote can be used. The waste in the past use made of cooking, kitchen-gardening, and laundry in the schools has been that the simpler, more active parts of such work has been delayed until the child gets nothing valuable to him in such simple operations, because activity in itself no longer appeals to him. The beginning of this stage is the moment to meet the child's new intellectual demands through experimental work, by means of which he can feel that he himself is inventing and applying processes to new materials. Such work should lead to (at least at the close of this period, somewhere between ten and twelve years of age) a concrete classification of foods used from various points of view, such as sources, methods of preparation, etc. The new element of arrangement, through a review of his past experience with the satisfaction of a wider view, will furnish the new intellectual element. He will then be ready to apply the methods of the past to new materials whose nature he can determine for himself.

The general educational values, then, of social occupations may be stated as follows: continuity of school and life; their social value as affording opportunity for easy combination of individual and co-operative responsibility with the gratification of strong social instincts; continuity of interest; and use of such simple processes that the child can gradually gain control of ends more and more remote.

WEAVING AND BASKETRY BY PUPILS IN PRIMARY GRADES.

ARTISTIC HANDICRAFT IN THE PRIMARY GRADES.[1]

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FOR many years "construction work" has been written in our course of study. All of us have believed in the necessity of hand-training and its relation to the mental development of children. Living up to their best light, our primary grades have been trying to solve this problem, and have attempted many constructive exercises that proved themselves almost useless and without the first element of beauty. Paper chairs that will not rock and paper wheels that will not turn are a rather discouraging and unsatisfactory product.

Last summer a party of Minneapolis principals and teachers spent a few weeks at the Chicago Institute and at the Summer School at Chautauqua, refreshing their minds with study and seeking sources of

[1] This paper was prepared for the joint session of the Manual Training and Art Education Departments of the National Educational Association at Detroit, July 10, 1901. In the absence of the author, the paper was read by Miss Bonnie E. Snow, supervisor of drawing, Minneapolis, who illustrated it with an exhibit of pupils' work.

knowledge wherewith to enrich their future work. Here attention was called to weaving and basketry as connected with the study of primitive peoples, and as a phase of manual training for young children. To those of us who had known of the fruitless plans and gropings after something better in the industrial line came the thought that here was the foundation for occupations that would develop both hand and brain power, and would result in products of some practical use and even artistic worth. It is needless to say that, roused by the needs of our pupils and inspired by the possibilities in store, this line of work was pursued with a vigor and interest characteristic of our teachers.

Returning in September, the arts we had acquired were shared with fellow-teachers, who were quick to see their value, and lessons were planned and given to large classes and to individuals, as opportunity offered. The spirit of industry rapidly spread, until before the close of the first term nearly every building in the city was engaged to some extent in the good work, though to a large degree in an experimental way. The question of materials was rather a formidable one at the beginning. The sympathy of our superintendents and supervisors was evinced in a very practical way by the readiness with which they joined the principals in contributing a sum sufficient to purchase enough material for a beginning. Small hand-looms of paste-board, soft and pliable for little fingers, were used, and many a little rug of pleasing colors and simple design was woven. These looms were afterward replaced by larger wooden frames similar to slate frames, and made by older pupils. Ravelings of carpets, yarns, and Germantown wools, large and soft, were used, being supplied mostly by the children, with generous contributions from other sources. Our school board has shown its appreciation of the value of this work by voting a liberal sum for its continuance the coming year.

Class exercises of rattan weaving, and a combination of rattan and raffia, were given in a variety of stitches evolved from the inner consciousness of some of our more resourceful teachers. This was largely individual work. Children were taught in groups, who in turn showed their classmates. These exercises resulted in some of the most artistic work of the year.

Raffia, which is a product of the Madagascar palm, is rich in possibilities. Hats for dolls and people, mats, boxes, and shopping bags of real service, which easily claim commercial value, and which can be disposed of in the Twin Cities, as well as any other well-made article

CHILDREN'S PLAYHOUSE, BUILT BY SEVENTH-GRADE BOYS AND FURNISHED BY PUPILS OF FIRST GRADE.

of service, were fashioned. But the work has not been prosecuted as a source of revenue, but as a means of education.

Nor are we dependent upon materials of commerce. Willows from the roadside have lent themselves to the making of serviceable baskets, and even the reeds and grasses have found a use. Pretty effects have been produced by coloring both raffia and rattan with diamond dyes. Few tools are required. A knife, a pair of scissors, and a worsted needle are all that is necessary. One lesson a week has been given in handicraft above the first grade. In that grade it has been used largely as "busy work" for the leisure moments that always come.

As far as has been practical, the co-operation of the older pupils has been enlisted—these doing those portions which require the

BASKETS WOVEN BY PUPILS IN GRADES FROM THREE TO SEVEN.

greater muscle, while the smaller fingers carry the work to completion. A feeling of unity and spirit of interest and helpfulness throughout the building have developed in a very marked degree through this plan.

An effort, never lost sight of, has been made to place before the children high ideals as to excellence of results in strength, durability, quality of workmanship, and artistic worth. To this end class and individual discussions have always formed a part of every exercise of this kind: "What shall we do in this emergency?" "Think out for yourself a plan for producing this or that effect." Always, "What do you think is the best way to do this?" As a result we feel a just amount of satisfaction, for a beginning, in the exhibit found in our state building in Buffalo, and in that placed before you today.

The revival of handicraft is in no sense local. It is entering all circles and attracting the attention of educators all over the country as a means of hand and brain development and as presenting a means of expression for the other work of the school. A recognition of the need for such work is growing every day. To meet this need in the primary school I know as yet of no more satisfactory means than that here presented, and I know of no portion of the school work in which the life and individuality of the child are embodied so much as here.

ASSOCIATIONS.

THE EASTERN MANUAL TRAINING ASSOCIATION.

The eighth annual meeting of the Eastern Manual Training Association was held in the Central High School, Buffalo, N. Y., June 27, 1901.

Mr. William E. Roberts, president of the association, briefly introduced Superintendent H. P. Emerson, of Buffalo, who delivered an address of welcome. Mr. Emerson, expressing his disappointment at seeing so few present at the opening meeting, said the impression seemed to prevail that the meetings were for delegates only. The meetings were open to all, and the workers in the field of manual training needed the help and encouragement of other workers. Manual training is still young, and people still need to be educated as to its purpose and its value. The speaker said that he had been in sympathy with manual training from the beginning, and was gratified to observe the steady improvement which had taken place in the quality and quantity of the work in the Buffalo schools under the direction of Mr. Upton. A brief outline of the scheme of work was then given. That men sometimes lose great opportunities by failing to see the trend of affairs was illustrated by the story of an offer which had been made a number of years ago to a university in the state of New York to erect and equip a building devoted to instruction in mechanical arts. This offer being declined, the money was offered to Cornell University and accepted, and resulted in the founding of Sibley College. Mr. Emerson expressed the hope that the meetings of the association might be pleasant and profitable, and that the members might enjoy their stay in Buffalo.

President Roberts was of opinion that Mr. Emerson had been too modest in his estimate of the progress of manual training in his city. The message which had gone out from Buffalo had attracted wide attention and had been helpful to many.

Preparatory to the serious business of the day the program was enlivened by a song by Miss Ada M. Gates, which called forth the hearty applause of the audience.

EXPRESSION IN ITS RELATION TO EDUCATION

was the subject of an address by Colonel Francis W. Parker, of Chicago Institute, who was greeted with much enthusiasm.

Nothing, he said, had entered the schools of this country with such promise of usefulness and permanency as manual training. Through evolution the civilized man had become what he is. The senses and all means of thought-manifestation had been evolved by means of self-activity, the plain inference being that under the immutable laws of evolution self-activity must be continued. "Education is assisted evolution." Nineteen years of experience have proved that children find their greatest delight in that self-activity which creates and constructs. Instinctive activity may easily be developed into activity with a conscious purpose. The whole machinery of thought demands self-activity through expression. Failing activity, there is atrophy. All-sided activity is the foundation of complete living. Woodwork, iron-work, cooking, work in textile fabrics, clay-modeling, painting, and drawing as modes of self-expression are good, each in its degree, each leading to a broad study of the materials

used, but no one alone is sufficient. But of all kinds of manual training there is no other, the speaker said, to his mind more profitable and more comprehensive than horticulture. Through it the pupil comes in contact with nearly all questions of natural science. It furnishes a fundamental study of nature and of man.

It is a simple and fundamental fact that all mental growth is absolutely dependent on the growth of sensations. This Dr. Dewey has called the organic circuit. Sensations pass into images. Images are the basis of reason. The completion of the circuit is the manifestation of a sensation through the outgoing nervous force, and this fixes the sensation in the brain for growth. The same law of growth applies to the image. Expression holds the image for growth. Without expression, mind-growth is impossible. The modes of gesture are speech, music, making, modeling, drawing, writing. Education consists in doing one's best in every direction.

Then followed a brief analysis of the various modes of expression, one infereuce being that the tactile sense, which is the "giant sense," is best developed through making and modeling. If all these modes of expression are necessary to true education, how shall they be taught? Courses of study are overloaded, and teachers and pupils are overburdened. Is there any central principle that shall guide us? The early use of all the modes of expression may be perfectly reconciled, first, by studying the needs of community life and of the child in his relation to community life. If these are reconciled, handwork will be the outcome. Second, all handwork should have for its intellectual function the growth of images. To develop, through expression, those images which will give a maximum of moral, mental, and physical power is the most important task of the teacher. With this single purpose in view the confused elements of teaching would be reconciled and correlation become a necessity. The question will be asked: Should there not be a logical sequence in the work? "My answer is," said Colonel Parker, "that logical sequence is the root error of all education, for it leaves out the child." Skill in technique will take care of itself, if the mental, moral, and physical powers of the child are taken into consideration. To go through work for work's sake, with no thought behind it, is uneducative to the last degree. Creation is the highest function of manhood. Human beings have been crippled, and possibilities of growth have not been realized. He who finds principles and puts them into action is the teacher of the twentieth century.

The next speaker introduced was Professor F. W. Smedley, supervisor of child study, Chicago, whose paper is promised for a future issue of this MAGAZINE.

Following this was a paper by Mr. William I. Crane, Steele High School. Dayton, O., whose theme was

A PLEA FOR THE EDUCATION OF THE HAND.

Mr. Crane said that, in forming courses of study, superintendents and others had followed the plan of comparing the curricula of other schools and striking an average, forgetting the ultimate purpose of the development of the child. All animal life is characterized by self-activity. In the lower animals it is chiefly destructive, in man, constructive. The schools had confined their attention to the development of receptivity, which is opposed to the constructive idea. When in the process of evolution man diverged, his development was chiefly of the hand. Accidental manual training had been the cause of civilization. In the struggle for supremacy, those who had the greatest manual training triumphed. The training of the hand reacted on the mind

and on the moral sense. Ethics grew out of the recognition of property, which could be appropriated. The want of constructive ability is eliminating savage races, and the ranks of the unemployed are recruited from those who have had no manual training. Constructive self-activity must be the next great educational movement. Those who are not educated manually, said the speaker, never make anything — except trouble.

Here Mr. Crane exhibited a chart in illustration of the relation of manual training to life. The mind, he said, is capable of understanding and expressing. Impressions come through the senses. The avenues of expression are the tongue and the hand. Those ideas only are of value which have found lingual or manual expression. The modes of expression were analyzed as follows: The tongue, (1) language (spoken) and (2) music (vocal). The hand (1) mechanic arts; (2) landscape gardening; (3) sculpture; (4) painting; (5) architecture; (6) music (instrumental); (7) language (written or printed). It will be seen that nearly all expression must be manual, and a man's value to society is exactly proportionate to his expressional power. Manual training is the cultivation of the hand to express the thoughts of the mind. Our schools have been training walled-up minds. The reformatories are trying to reform men for doing what they never would have done but for training in purposelessness. An ideal kindergarten is the most perfect school, a school of impression and expression. The same kind of training should continue, but we stop it at the third year.

Mr. Crane said he had much faith in public sentiment. He believed that manual training would be universally adopted as soon as the people understood its value.

In reply to a request for more light on the objection to logical sequence in teaching, Colonel Parker said that, first, such sequence was not related to anything else — it made manual training an isolated subject. Secondly, a child should be allowed to do what he *can do*, not what you say he can do. To say that a child must do this today, that tomorrow, and so on, and all children do the same thing, is against all psychology. Thirdly, the child should work with a purpose. Everything we have in the line of system comes from Europe. Purpose is of America. Don't hinder an American citizen in embryo from doing just what he can do.

Mr. Trybom thought Colonel Parker's views discouraging to the average teacher who had to deal with classes of forty or fifty. Let each individual in such a class do whatever he pleases, and imagine the result.

Mr. Vroom held that this wholesale education, rather than logical sequence, was the great hindrance to ideal teaching. Some degree of systematic arrangement was necessary in large classes. Even Colonel Parker would have a logical sequence for the individual. That which the child can do today, followed by that which he can do tomorrow, forms a sequence, and it is presumably logical.

Professor Richards suggested that it is the psychological order that is really important. The term "logical sequence" needed explanation. When we use this term, we are thinking only of the sequence of physical difficulties, but there is a logic of motive and of relations which overrides any logic of difficulties schemed out by the teacher. This is particularly true of young children.

Mr. Knox said the logical sequence in manual training had been developed on sound principles. Professor James had said Salomon's system was the best from an educational standpoint.

Mr. Upton was in sympathy with Colonel Parker's views, but appreciated the

difficulty pointed out by Mr. Trybom. In a private school he had based the value of the work on the interest of the child, but the same method could not be brought into the public schools under existing conditions. He did not believe in basing a course of work on a logical sequence of tools. Much must be left to the judgment of the individual teacher.

Miss Nichols found the problem under discussion a most difficult one. If we find that a child would rather build a house than make a wedge, should we therefore let him do it? If children attempt what is beyond their powers, and do poor work, people will say: Give up manual training.

Professor Smedley held that a child who did not take the initiative in his own work was losing the value of manual training. He believed much harm had been done by exhibition work.

Several other speakers contributed to this interesting discussion, the general trend of opinion evidently being that, while the abandonment of "logically" arranged courses in manual training in the lower grades was an end to be desired, it was necessary to move cautiously and slowly under existing public-school conditions. The bearing of manual training on the problem of correlation was happily brought out by one of the speakers, who said that manual training is already in touch with the real life of the child. Let the class teachers now see that other studies are correlated with the child's life, and we shall have correlation.

The president closed the meeting with the announcement that the next session would be held on Friday morning, the arrangement having been made that the afternoons should be left free for other purposes.

The attendance on Friday morning was large. The proceedings were opened by the president, who read a letter of greeting from the Department of Manual Training of the National Educational Association.

MR. HUBBARD'S ADDRESS.

The first address was by Mr. Elbert Hubbard, founder of the Roycroft Shop, East Aurora, N. Y.

In connection with a graphic account of the development of the Roycroft Shop Mr. Hubbard took occasion to urge the value of manual training as an educational agency, now and then sharply criticising the methods of our schools and colleges. East Aurora, he said, was a town of about 1,500 inhabitants, where there was no poverty and no wealth. The average income of the people was about $450. In the Roycroft Shop they made books which sold at from $2 to $200 or $300. They had got away from competition by making books better than others could make them. East Aurora books had been sent for from Paris, London, and other cities of the Old World. There were no bookbinders in America, Mr. Hubbard said, and there were no shoemakers in Lynn. But there was a demand for bookbinders. In East Aurora they had imported a skilled workman and were now teaching boys and girls how to bind books. Many thought it strange that country boys and girls should become skilled workers. He sometimes thought we knew little about education. Your boy may go through college, and you may have to support him ever after. If you have college degrees, keep them handy so you can flash them, should anyone dispute that you are educated. There is no science of education so long as you send out men and women who cannot *do* anything. The speaker had asked Dr. Dewey what he was doing. "Oh, trying to overcome the disadvantages of civilization," was the answer.

He believed in Dr. Dewey's methods. Give your child a pair of scissors and a copy of *Munsey's*. What better use could be made of *Munsey's?* Our school children are victims of arrested development. They are sent out into the world, and the bread-and-butter problem comes on them and finds them unprepared.

At the Roycroft Shop, Mr. Hubbard said, they had no masters and no foremen, but they had teachers. They used no locks. They had a library and a gymnasium. In one room were forty girls at work with nobody in charge. They believed in people. We make money by giving the other fellow a chance.

The development of the book-making establishment was then outlined from its beginning with the publication of a pamphlet in 1895. Finding that there was not work enough to keep their one boy busy, they started a book. Later a girl suggested leaving the initials blank, and offered to draw them in. The suggestion was adopted. Soon another girl was sent for and taught to draw; then Mr. Hubbard issued an advertisement offering to teach boys and girls how to print, how to use water colors, and to bind books. Then a new shop was built in the style of an old English chapel. Then a gymnasium was built, then an extension, and at last the library, for which the men and boys employed in the shops brought the stones from the neighboring fields. Everybody about the Roycroft Shop was industrious and contented, and there was no bossism. "It is a good scheme," said Mr. Hubbard in conclusion; "we are making money and having a lot of fun."

HANDWORK IN THE PRIMARY GRADES

was the subject of an address by Professor Richards, of Teachers College, Columbia University, New York.

In this paper Professor Richards strongly urged the importance of greater freedom in methods of teaching handwork in the primary grades. Handwork, he said, has no place in the school as mere drill. To fulfil its purpose it must be a means of the natural expression of the interests of the child. As Professor Dewey says: "There is discipline only when one can put his powers fully and freely at work upon that which is intrinsically worth doing." The child's natural activities before he comes to school indicate one of the most vital factors in child growth — the practice of putting thought into form and into action, the building up of ideas of the natural world, and the deepening of impressions. Handwork which is to be the natural expression of ideas that are natural to the child will not be a blind copying of something put before him; on the other hand, it will not mean careless execution, but, on the contrary, will show a maximum of care, because it means a maximum of motive. Self-expression in handwork will not mean of necessity the conception and design of things as a whole, but may involve the development from the pupil of a general plan to attain an end, the adjusting and modifying of details; it should always mean that the worker's own thought and feeling are contributing to the end for which he is working. "A nice sequence of difficulties in the work may be of less importance than the question of motive or the significance of a project to the real interest of the particular moment."

The speaker next took up the question of the particular interests which might be expressed through handwork in the primary school. These interests centered about material things, and might be classed as in-school and out-of-school interests. As to the first, rich and varied opportunities for constructive work are found in connection with the different subjects of the curriculum. There are two tendencies to be

considered — the tendency to mere representation and the desire to make something practical and useful, the first being more prominent in the earlier years. Group work is valuable in these years. It introduces co-operative work and allows of larger undertakings than individual work. Such work, of course, presents difficulties in large classes. For work of this nature there can be no fixed course. It is simply a giving-out side added to the taking-in side of school work. With reference to the out-of-school interests we must deal with things directly useful, and must adapt the work to the individual interests of the pupil. Here again no nicely graded system will answer. We must have variety in materials and processes as in the projects undertaken. The problem of practicability is, of course, important, but we cannot conceive that it will remain forever unsolved. One important step toward the solution of the difficulty would be the provision of a separate room for handwork in the primary school, but of much more importance is the preparation of the grade teacher to teach it. When this is attained the day will have passed when manual training is thought of as a little work with tools in a room, apart from and divorced from all other interests of the school. "When this time comes," said Mr. Richards, "and manual training shall be reaching out to serve all the natural and varied interests of school life, then, and then only, will handwork come into its full educational inheritance, and then, and then only, will it find its full possibilities as one of the most powerful, because one of the most natural, expressions of child life."

At the conclusion of this paper the floor was granted to Mr. Trybom, who, on behalf of Mr. J. E. Wigman, of Omaha, Neb., presented to the association a handsome gavel in token of the cordial feeling of the West toward their co-workers in the East. The gavel was made by one of the high-school pupils of Omaha. After a suitable expression of appreciation by the president, the secretary was requested to convey the thanks of the association to Mr. Wigman.

The meeting being now opened for general discussion, several questions were asked with reference to the group work mentioned in the last paper. In reply Mr. Richards said there was no need of the teacher doing any work for the children, but there was need of foresight and planning. The putting together of class projects was the most difficult problem. The children there needed most careful supervision. The kind of co-operative work most practicable was that in which each worker could contribute a definite part. In the first two grades of the Horace Mann School group work occupied about one-third of the time; beyond that the work was chiefly individual. In classes of forty or fifty purely individual work was impossible. To leave the work to the mere whim of the child was the worst kind of teaching. To bring in self-expression with advantage demands most careful study on the part of the teacher.

Mr. Connelley said he had found the assistance of the grade teachers very valuable in co-operation with the special teacher in primary-grade work.

In reply to the protests which had been made as to the practical difficulty of doing ideal work in large classes, Mr. Smedley said it was true that a class of sixty was not an ideal class, but we should discuss what is ideal. It was thought that children were deficient in memory. No doubt boys in general remember very little of what they read in books, but they are marvels of information on baseball. The ideal way is to let each work up something along his own line of interest.

Mr. Bates did not believe in teachers tying themselves too closely to courses of study, but he felt that the determination of what is good and what is bad in self-activity demanded great thought and care. Teachers were the best judges of what is good.

Two workers in the field of manual training in the South spoke of the difficulty of obtaining recognition of the true meaning of the work there. In the manufacturing towns the children leave school early, and parents think that manual training should have a close relation with the boy's subsequent occupation. Since the adoption of manual training in a Texas high school the attendance has increased 50 per cent. They were now trying to carry the work into the lower grades.

The discussion was here directed toward the value of accuracy in manual training. In reply to a teacher, who held that things should be made "accurate and true," Colonel Parker suggested "true and accurate" as a better arrangement. When a teacher tried to make a child express what was not in him, that was not truth. Accuracy should be regarded as a means, not an end.

While Mr. Upton indorsed the view that accuracy was not the chief desideratum, he disapproved of slovenliness. With keen interest on the part of the worker accuracy would take care of itself.

One speaker said that, if we thought more of the development of the child and less of the accuracy of the work, we should no doubt be approaching nearer to our ideals, but if we lived up to our ideals, we should very soon lose our situations.

The next paper was by Mr. George A. Robbins, of Chicago:

AN ECONOMIC PLAN FOR MANUAL TRAINING IN SMALL COMMUNITIES.

In introducing this subject, Mr. Robbins said that the adoption of manual training in small communities had been hindered by the expensive equipments of manual-training high schools, which had given wrong impressions to visiting committees. Today an equipment for classes of twenty-four costing $150 for tools, $60 for benches, and $15 for a grindstone, is used. As an example of a still cheaper equipment Mr. Robbins described the outfit of a vacation school at Morgan Park, where the total expenditure for two classes of twelve pupils each, exclusive of teacher's salary and incidental expenses, was $104 for the term of six weeks. The individual equipment consisted of one Disston's 12-inch back-saw, one coping saw with one dozen extra blades, one ½-inch firmer chisel, one marking gauge, one rule, one 6-inch try-square Three benches were used, each accommodating four pupils. A drawing of the bench was exhibited, and a list of the general tools given.

Basing his estimates on the Morgan Park experiment, Mr. Robbins offered the following plan for equipping a school: For a class of twenty-four pupils six such benches would cost $45. Twenty-four kits of tools at $3.18 would cost $76.32. A further expenditure of $30 for a grindstone and tools for general use would make the total cost $151.32. Four classes per day, giving 90 minutes to each class, could use the tools. One lesson per week would permit 480 pupils to receive instruction. Allowing 33⅓ cents per pupil for material, the expenditure would be $160 for 480 pupils. The total expenditure for installing manual training according to this plan is $311.32.

In the Morgan Park school the pupils were permitted to select the things they wished to make. "Self-directed activity along self-chosen lines," said the speaker, "is the highest degree of true economy." It was observed that the children in the vacation schools having daily lessons did not produce as much in quantity as public-school children generally do in the same number of lessons. From this the inference was drawn that a longer interval between lessons was beneficial, especially among younger children. With regard to the expenditure for teachers' salaries, Mr. Robbins

held it to be the extreme of prodigality to pay money to incompetent teachers. To waste the efforts of the children was a more serious fault than excessive financial expenditure. "Prodigality in the line of equipment may be excused, but there is no excuse which human ingenuity can devise for that prodigality which retards soul-growth."

Mr. Craig, of Tuskegee Institute, desired to emphasize what had been said with reference to incompetent teachers. The unfitness of many teachers in the negro schools and the indifference of supervisors were deplorable.

In the course of some remarks before the adjournment of the meeting President Roberts said it was a matter of regret that manual-training teachers throughout the country had shown so little disposition to support the association. The thought pervading the letters which were constantly coming in seemed to be: What can I get out of it? Prompted by a right spirit, these people should rather inquire: What can I do for the association and for the cause? Many things which the association desired to do were left undone for the want of support.

The Saturday meeting opened with a good attendance. An invitation from Mr. Hubbard to visit the Roycroft Shop in the afternoon was extended to members of the association.

DOMESTIC ECONOMY FOR THE SCHOOL GIRL.

In an interesting paper on this subject, Mrs. Nellie S. Kedzie, of Bradley Polytechnic Institute, presented a strong argument in support of domestic economy as an integral part of a girl's education through all grades of school life. The truest education for a girl is that which will best help her to become a strong, earnest woman, and to raise the standards of the people about her. We had heard much of the three R's, and were now beginning to hear of the three H's, the heart, the head, and the hand. Domestic economy planned for the school girl should give her, from the time she enters the lower grades till she steps out of the university, something every year which will help to make her, not only a cultured woman, but a capable woman, a woman who knows how to use heart and hand as well as head. Where, when, and how to put this work into all schools for all girls is one of the great educational problems of today. In these days, when so much is demanded of our women, we must give them everything possible to help them. We have no right to ask them to make bricks without straw.

Domestic economy should have a definitely practical turn, and prepare a girl for home duties. In the earlier years the work must be largely manual training. From this will grow a knowledge of everyday surroundings. Much will be learned of the production of silk, wool, cotton, linen, etc. Thus the products of various countries will begin to be understood, with the characteristics of the people, the climate, and other conditions. At a more advanced age the production of foods will be studied, and geography and arithmetic will be of greater interest because they deal with things the pupil knows about and handles. Domestic economy also leads to a knowledge of physics, physiology, chemistry, and bacteriology. The girl who takes up all these lines of scientific study with a definite thought of using them for home life is the girl who is getting, not only scientific training, but a training which will mean usefulness both to herself and her neighbors.

Mrs. Kedzie spoke strongly against putting what is called the "classical side" of education over against the useful side. "Unless there be a knowledge of the use of words rounding itself out into ability to impart knowledge, then we might as well

be machines as human beings." The value of interest in the subject of study was illustrated by the plan adopted in an Illinois county, where the country teachers had made a practical application of arithmetic, geography, English, etc., to things with which the pupils come in daily contact about the farm or the home. This personal interest is a strong feature of domestic economy. Taken in its best sense, domestic economy means simply knowledge of home-making. Every girl will, at some time in her life, be almost certain to have need of such knowledge, and it is our duty to give her all the help we can.

In discussing this paper Mrs. Ida Hood Clark said nothing was doing so much to make good citizens as the cooking school when rightly conducted. Health and strength are dependent on diet, yet few know anything about the selection and preparation of food from a scientific point of view. Much waste also resulted from ignorance of the truths taught in the cooking school.

Mrs. Kedzie, in reply to a question, said she would advocate cooking in the seventh and eighth grades for girls who were not likely to go to high school. It would be regarded as manual training rather than the scientific study of cooking.

Several speakers advocated the introduction of cooking in the lower grades, while others opposed it. Mrs. Kedzie thought it largely a matter of expediency. It might not be advisable to take time for it from other occupations.

The next speaker introduced was Miss Lisbeth M. Gladfelter, St. Louis, Mo., whose subject was

THE STRONGEST PLEA FOR DOMESTIC SCIENCE.

Miss Gladfelter said that the end of education was to develop the individual — to establish his relation to the outside world and the universe. The best subjects of study are those which best train the individual to take his place in the world. The wonderful advance of the United States among the nations has been due to education. Education will dispel ignorance and vice and enable everyone to earn his own living, when the "lower classes" will be no more. People are bad because they lack motives to be otherwise. A large part of the time in our schools has been devoted to the study of words. In domestic science things are substituted for their symbols. Children learn to *do*, and doing will blossom into being. Pestalozzi's plan was one of observing. Froebel's was a plan of observing and inventing. The kindergarten was but a suggestion of something better. Domestic science was not for the poor alone, as a charitable measure, nor was it for the rich as a corrective. It was an educational measure equally advantageous to all. Training of hand and mind was alike necessary. Work not based on knowledge of principles must fail. True knowledge is based on good work, and good work on sound knowledge. Domestic science also develops the æsthetic sense. Girls are educated in habits of order and neatness, and this brings self-respect. The interest of the pupils is aroused by doing something intimately connected with their needs. Girls need to be restrained rather than stimulated.

The discussion on this paper centered mainly on the question as to whether girls should be taught woodwork and boys cooking and sewing, the majority of those who spoke taking the affirmative. Mr. Upton remarked that men would say, if a girl attains to a knowledge of how to conduct her home properly, it is all she needs in this world, but he would allow her to do a little woodwork while the men were not around. The advantage of some knowledge of cooking to boys was illustrated by a story of camp life. One boy was watching the cocoa, another the meat, another the eggs, and

a fourth something else, when one of them found himself confronted by a knotty question. "We have only one cook at home," he said, "to look after everything. How does she do it?"

Following this discussion was a paper by Superintendent C. B. Gilbert, of Rochester, N. Y., which will be printed in full in a future issue.

Several members indorsed the view of Superintendent Gilbert that manual training should be made a regular branch of instruction in all high schools rather than be confined to special manual-training schools. Professor Richards said the battle as to the true scope and meaning of manual training had apparently been fought fifteen years ago. It was then agreed that manual training should be purely educational in the high school. The question was now coming up as to whether the tendency toward trade training in these schools shall grow. One way to check this tendency was to make manual trainining a department in all high schools.

BUSINESS MEETING.

The secretary's report being first called for in the order of business, Mr. Irons stated that the association was constantly in receipt of letters asking for information on various subjects. He recommended that, to assist the secretary in answering such inquiries, estimates of cost of equipment and other information of general interest should be published by the association. The financial standing of the association, Mr. Irons said, was better than ever before, and the membership larger.

Mr. Richards, for the executive committee, reported that invitations had been received from Pittsburg and Utica with reference to the next annual meeting. The committee's recommendation that the meeting be held in Pittsburg was adopted.

Regarding the time of meeting Mr. Vroom asked that the association consider the advisability of placing it a little later than in past years for the benefit of those who could not attend before July 1. In New York city there were a considerable number of teachers who were practically debarred from the privilege of attending the association meetings, as the public schools did not close before the end of June. On motion by Mr. Robbins, it was ordered that the meeting be held on July 1 and 2, two sessions each day.

Mr. Robbins submitted a proposal for the organization of smaller associations of manual-training teachers for the purpose of discussing topics of interest from time to time. These local conferences might furnish useful material for debate at the annual meetings. After some discussion, the matter was postponed for future consideration.

The meeting next proceeded to the election of officers, with the following result: president, Daniel Upton; vice-president, Mrs. Ida Hood Clark; secretary and treasurer, Clifford B. Connelley; members of executive committee, George A. Robbins, George H. Bryant, J. H. Trybom.

This closed the proceedings of a meeting which was second to none in the history of the association in numbers and enthusiasm, and, it is safe to add, in influence.

WILLIAM F. VROOM.

THE NATIONAL EDUCATIONAL ASSOCIATION.

THE fortieth annual convention of the National Educational Association, held in Detroit, Mich., July 8 to 12, was one of unusual interest and significance for manual-training workers. This was due, not merely to the superior papers, large attendance, and helpful discussions in the sessions of the Department of Manual Training, but even

more, looking at the matter broadly, to the fact that manual training in some of its aspects found a welcome place in many of the strongest papers in the general sessions and the various departmental meetings. Indeed, whereas only a very few years ago in these meetings manual training seemed to be little understood or appreciated, this year, as a rule, it was intelligently discussed and its true function and value pointed out.

Particularly was this true in two of the general sessions — those on "Elementary Education" and "Economics and Education." In the former, Superintendent F. Louis Soldan, of St. Louis, read a paper on "What is a Fad?" in which he said that drawing, music, and manual training are not fads as long as they are limited to the elements of these arts. "A fad is anything on which stress is laid in excess of its real educational value, and which for a time is overestimated." Superintendent James C. Van Sickle, of Baltimore, in a paper on "Is the Curriculum Overcrowded?" pointed out that a curriculum is not necessarily crowded because it contains many subjects. It is not expected that each child should master everything mentioned in the course of study. He takes what he is capable of assimilating and no more. The old curriculum was overcrowded with things not worth remembering; the new is none too broad to meet varying needs. It is what it is by reason of public demand, and, rightly used, it is not overcrowded. Manual training, drawing, music, gymnastics, and elementary science are properly becoming a part of the general fabric of school work. Professor Charles R. Richards, of Teachers College, New York, followed Superintendent Van Sickle with the paper we print as the leading article in this issue.

Perhaps no paper read during the entire convention called forth so much favorable comment as that on "Social Science and the Curriculum," presented by Professor George E. Vincent, of the University of Chicago, before the general session on "Economics and Education." Professor Vincent believes the solution of the great problem of American education lies in

BRINGING THE SCHOOL INTO CLOSER RELATION WITH LIFE.

The studies which have been too far abstracted from human experience must be brought back again into contact with the concrete social experience from which they sprang. The highest ideals of co-operation, loyalty, sacrifice, which men have wrought out in the past and the present must live again in the personalities of the young.

In defining what is meant by the socializing of education, Professor Vincent said:

"With the centuries the growing mass of human knowledge has been more and more minutely subdivided; man's world has been resolved into its elements. But along with this analysis has always gone the effort to patch the pieces together, to keep man's experience whole.

"This great antithesis appears in our current educational theory and practice. On the one hand we find the constant pressure of new subjects which clamor for admission to the curriculum; on the other hand we hear the cry for correlation, co-ordination, concentration. It is urged that the life of the child must not be broken up into unrelated fragments; that all these artificially divided studies must be related and kept in unity in the child's growing mind.

"Still another tendency asserts itself. We hear much in these days of 'the social aspects of education,' of 'the sociological basis of education,' of 'the school as a community,' and of 'school and society.' If one may risk the interpretation of vague movements of thought such as these, I venture to assert that this social tendency of education is only another aspect of the inevitable process by which men struggle to see things whole. The conception of the origin and development of the nature and

end of society sweeps into unity all the fragmentary knowledge of mankind. The socializing of education, then, is an effort to give pupils, little by little, a way of looking at society, which shall enable them gradually to see things in their relations to order conduct, and to contribute something to the stability and enrichment of the life they live in common with their fellows."

THE SOCIALIZED CURRICULUM.

Again, speaking of the socialized curriculum, Professor Vincent said:

"The socializing movement is well under way. In kindergarten and elementary school, social materials have long been recognized. The simple industrial processes of weaving, clay-modeling, woodworking, and food preparation have been utilized, but in rather too conventionalized a way. We note in Professor John Dewey's theory and practice the beginnings of a movement back to nature, or, rather, back to primitive manufacture. Children weave baskets rather than paper mats. They mold pottery rather than balls and cubes. They make looms and wagons and houses rather than conventional elements of carpentry. They cook food for actual use instead of making premature experiments in physics and chemistry. This manual training may be socialized in the sense that it may be brought closer to social life and its actual activities, past and present. In later stages it becomes inevitably and properly more conventionalized, specialized, and concise.

"About these industrial processes naturally gather ideas as to the utilizing of raw materials, the working of them into finished products, the comparison of crude, primitive processes with the highly organized production of today. It is impossible to deal with these topics without grouping about them many facts of social and industrial history; thus the idea of change in human affairs, the ideas of organized industry and of commerce, gradually emerge from these activities and interests of the early grades."

In like manner Professor Vincent showed how geography, history, literature, mathematics, and natural science may be vitalized by this socializing process.

The officers of the Department of Manual Training were particularly fortunate in being able to arrange with the officers of the Department of Art Education for a joint meeting on Wednesday afternoon. This was held in the First Congregational Church, a beautiful brownstone structure, peculiarly suited to such a meeting, where art and handicraft were to be considered. The meeting was called to order by Professor Charles A. Bennett, of Bradley Polytechnic Institute, Peoria, Ill., president of the Department of Manual Training. Mr. Foster H. Irons, of Saginaw, Mich., was asked to take the place of the absent secretary. The first speaker of the afternoon was Miss Clara I. Mitchell, of Chicago Institute, now School of Education, University of Chicago, who presented the paper on "The Textile Arts as Constructive Work in Elementary Schools," which we print in full on pp. 12–19. The second paper, entitled

ARTISTIC HANDICRAFT IN PRIMARY GRADES,

was prepared by Miss Helen M. Maxwell, principal of Corcoran School, Minneapolis, but in her absence it was read by Miss Bonnie E. Snow, president of the Department of Art Education, and supervisor of drawing, Minneapolis. This paper is printed on pp. 26–30. After reading this paper Miss Snow showed a large number of pieces of weaving and basketry work done by pupils, telling many incidents in connection with their construction, and answering numerous questions which came spontaneously from her audience.

In the discussion which followed Supervisor Charles H. Keyes, of Hartford, Conn., said that we are certainly going to give up a great deal of the so-called busy work — purposeless manual training. There must be more purpose back of our work in manual training. We have worked too much with blocks, and now we are coming

nearer the crafts and the trade schools. He asserted that the work must be dominated more and more by the art teachers, and must become constructive art work instead of manual training. Manual-training teachers must learn from the art teachers.

Colonel Parker said that he would have the art and the manual training brought together, but he would not stop there. With these he would unite geography, history, and science. Clay he believed to be the greatest medium for developing the constructive art instinct, but the work must not be thrown back into the clay-box; a kiln should be at hand to complete the articles which have been molded.

Professor Richards, of Teachers College, wished to emphasize this union of art and manual training, but he believed that art needs as much help from manual training as manual training does from art. Will art education ever be able to reach its true ends until it builds on a basis of real use?

At the close of the session all present were invited to an informal reception in the church parlors and Sunday-school room, where music and refreshments were provided. Certainly no feature of the convention was enjoyed more than this. At its close, congratulations were showered upon Miss Myra Jones and Mr. J. H. Trybom, the chairmen of the local committees on art education and manual training, who were responsible for the reception.

The second session of the Department of Manual Training was held in the Central High School building on Thursday afternoon. The general subject of this session was

THE RELATION OF MANUAL TRAINING TO TRADE INSTRUCTION.

The first paper was entitled "Education for the Trades in America. What Can Technical High Schools Do for It?" This was presented by Mr. Charles F. Warner, principal of the Mechanic Arts High School, Springfield, Mass. Mr. Warner[1] pointed to the great need of more specific education for the trades, and showed how it is possible to extend the work of our manual-training high schools so as to supply, in a measure, this need. "It is a question of public education," said Mr. Warner; "and while teaching for the trades should never be considered the sole function of the manual-training or technical high school, such schools are nevertheless especially well fitted to make a beginning in this important line of educational work — a beginning which may not be called teaching the trades, but teaching for the trades." Such teaching for the trades is now being done at public expense in the school of which Mr. Warner is principal.

The second paper, by Superintendent Virgil G. Curtis, of the Toledo Polytechnic School, emphasized some of the points made by Mr. Warner, and called attention to technical and trade schools in Europe.

In opening the discussion, Professor Charles R. Richards, of Teachers College, stated that he found himself in hearty agreement with most of what had been said, with the exception that in his view the thing presented was not trade-training, but something very different. He defined trade-training as a preparation for immediate practical and profitable work at a trade, and pointed out the fact that not only did such a training require long, continued drill in a specialized class of operations, but that it was economically impossible for the class that forms the great body of trade-workers to continue their education into the high-school period. Such workers, in

[1] We had hoped to print Mr. Warner's paper in full in this issue, but limitations of space have prevented us. It will, however, be printed, with a stenographic report of the discussion which followed it, in the *Proceedings of the National Educational Association*.—EDITOR.

the great majority, come from the boys and girls that must become wage-earners directly after the compulsory school age.

On the other hand, Mr. Richards stated the conviction that manual training in the high school has an enormously important office in relation to industrial activity and trade development, but that that office was a very broad one. In his judgment it consisted in developing in a great number of future workers an understanding of the facts and forces of the industrial world, and in preparing these to enter intelligently and effectively into numberless relations with that world and become leaders in its various branches.

He pointed out that the eleventh census shows that between 20 and 25 per cent. of the whole number engaged in gainful occupations in the United States in 1890 were employed in manufacturing and mechanical industries, and that the value of the products of such industries was over half of the total value of the productions of the country. The facts, in the speaker's judgment, indicate that the manual training in the high school should be taken up in a very broad and yet thorough spirit. They indicate that such work should not only deal with special tasks, but should study the relation of these special tasks to industry at large. While representing as closely as possible the actual facts of industrial practice, the experience should not be limited to one special branch or to the acquirement of special skill. Materials should be traced back to their sources and the commercial processes of production studied; modern methods of manufacture should be compared with the simple operations of the school shop, and some understanding given as to the organization and operation of modern industrial establishments.

The speaker pointed out that all high-school work has a vocational character, but always of a broad type, and claimed that manual training in the high school should bear much the same relation to after-life as instruction in science, mathematics, and language — not to train for a narrowly specialized vocation, but to contribute to an understanding of modern life and its demands. In closing, Mr. Richards stated the conviction that such training, because of its broader influence, was of infinitely greater economic meaning than any attempt at trade-training, and would contribute a far greater service to the industrial progress of the country.

Dr. C. M. Woodward, of St. Louis, who followed in the discussion, emphasized the thought that every boy should have a chance to make the most of himself. No scheme of education should be adopted which assumes that a boy is to be held down to a single occupation; every system must be "open at the top." He described the conditions in some of the trade schools in Europe, and then declared such schools to be opposed to the genius of our American institutions. He recognized, as did Mr. Warner, the need of more instruction in fundamental trade processes, but he would not "take advantage of an immature and ignorant boy by forcing him to decide what sort of business he wants to do in the world when he is utterly unfit to make such a decision." He was not in favor of converting the manual-training high school into a trade school.

Dr. Woodward believes that the manual-training schools, if sufficiently increased in numbers, will fully meet "all our industrial wants." At the present time the manual-training high-school graduates do not remain in the trades because they are called to higher positions; but, in the opinion of the speaker, when the number of such schools has been sufficiently increased, there will be a surplus of graduates for the higher positions, thus allowing many more to remain in the position of tradesmen; this, he believes, will meet every legitimate demand for trade-teaching.

Another objection to the teaching of specific trades urged by the speaker was that half of the boys are not fit to be mechanics. Trade schools would get many of these, but, owing to its narrow course of instruction, could not give them an opportunity to find out what they were fit for. It should be one of the chief functions of a school of secondary grade to help a boy to discover the line of activity best suited to his tastes and ability. To do this a school must be broad instead of narrow in its course of instruction.

TRADE SCHOOLS NEEDED.

Dr. H. H. Belfield, of Chicago, agreed with much that had been said by all the speakers. He would not convert the manual-training schools into trade schools; yet he recognized the need of more mechanics in this country. He doubted the ability of the manual-training schools to meet this need. A great majority of the boys leave our public schools at twelve or thirteen years of age, and these are the ones who in largest numbers seek employment in the trades. They learn their trades, if at all, under the greatest disadvantages. To help this class of boys trade schools are needed, but, in the opinion of the speaker, they should be started, at least, as were the manual-training schools, outside of the public-school system as private enterprises. He would have the great manufacturing establishments establish trade schools to train boys for their own work.

Superintendent Charles B. Gilbert, of Rochester, N. Y., said that he was interested in education in a large sense, and in the manual-training school as a department of public-school education, rather than in manual-training schools as such. From his point of view the manual-training high school, even, represents rather too close a differentiation for a public school. His experience has led him to the belief that it is better to have manual-training as a co-ordinated department of all high schools than to have separate manual training high schools. "The manual-training high school as a public institution requires a boy who is just finishing the grammar school to choose for himself a definite course, and if he is not ready to elect manual training as his dominant subject, he can get none of its benefits, which, it seems to me, is most unfortunate. I think every boy and girl, even those going to classical colleges, should have an opportunity to take at least some of the manual-training work." Mr. Gilbert considered the tendency of manual-training high schools to run into trade schools to be a dangerous one.

Gilbert B. Morrison, of Kansas City, said that in his city they had been trying for a number of years to work out the incorporation of manual training into the high school in such a way as to produce a high school normal to the present age. Their aim has been to raise the standard in respect to scholarship while furnishing the student a four-years' course in manual training and drawing. Mr. Morrison believes that "if manual training in public education means anything, it means the incorporation of it into the course of study in such a way as to make it a purely educative force. If it is ever justified at all, it must be justified on educational grounds. And it is not too much to say that the experience of the best schools proves that it has been so justified."

Mr. Warner was asked to close the discussion, and spoke in part as follows:

"In discussing the relation of manual training to industrial education, and the function of the technical high school in connection with preparation for the trades, it seems to me we are not called upon to consider the question of exclusive trade-training, its nature, and the proper time and place for it. Manual training has already astablished itself as a broad principle in education, and has brought all

grades of school work under its influence. We have schools already established in which education along mechanical lines is emphasized to a certain extent. But their chief aim is a broad one, as it should be. They certainly have not the characteristics of trade schools. I agree with Mr. Richards that no effort should be made to convert them into mere trade schools. But is it not consistent and thoroughly practicable for technical high schools to offer a training which shall amount to a real preparation for a certain limited number of trades, without sacrificing the broader educational aims of such schools? It seems to me that this is the question which has called for discussion, and that there is a very practical answer to the question.

"In regard to increasing the amount of time given to mechanical practice, which is an essential part of the plan, there is really no inconsistency if the extra time is voluntarily taken by the students after the regular school hours. Those who are especially interested in this kind of work are always ready to double or treble, in this way, the ordinary allowance of time for the shops. By this means an immense gain for the technical side of the work may be secured without damage to the academic studies. This, of course, involves an elective system, and should apply only to those who, at the end of the first or second year, elect the special lines of shop-work which the school is able to offer. Probably not more than half of the students of a technical high school would choose to specialize in shop subjects; but why should half the school, or even a smaller fraction, be denied this advantage, if they really want it, and are willing to increase their school hours in order to secure it?

"On the whole, I see no inconsistency in an extension of our manual-training courses with a view to training for the trades. When we come to understand more thoroughly what kind of industrial education is needed in this country, we shall find a way to give it the important place that it ought to have in our public-school system. In accomplishing this I believe we shall find our manual-training and technical high schools of great service."

BUSINESS MEETING.

A few minutes of the Thursday session were taken for business. On the previous day two committees had been appointed, one on nominations, consisting of Supervisor Charles H. Keyes, of Hartford, Conn., chairman; Daniel Upton, director of manual training, Buffalo, N. Y.; and Arthur D. Dean, of the Mechanic Arts High School, Springfield, Mass.; and one on resolutions, consisting of William E. Roberts, supervisor of manual training, Cleveland, O., chairman; A. C. Newell, director of manual training, Des Moines, Ia.; and Harris W. Moore, of Hartford, Conn.

The committee on resolutions submitted the following, which were unanimously adopted:

"*Resolved*, That we, delegates to the annual meeting of the National Educational Association, express our appreciation of the effective efforts of the officers of the Department of Manual Training and the local committees, for our instruction, comfort, and pleasure, in providing, first, an exceptional program; second, a suggestive exhibit of educational work; and, third, a delightful reception; and that our appreciation be made manifest by a vote of thanks.

"Further, as the joint meeting of the Manual Training and Art Departments has proved so instructive and significant, be it

"*Resolved*, That the officers of the Manual Training Department co-operate, if possible, with the officers of the Art Department in arranging a similar meeting for the coming year."

Following the presentation of this report, the president took occasion to express his personal appreciation of the generous way in which the officers had been treated in Detroit, and especially of the invaluable assistance rendered by Mr. Trybom, chairman of the local committee on manual training.

When the report of the committee on nominations was called for, Chairman Keyes reported the following list for the ensuing year, who were enthusiastically elected:

President, Professor Charles R. Richards, Teachers College, New York.

Vice-President, Principal Charles F. Warner, Mechanic Arts High School, Springfield, Mass.

Secretary, Supervisor J. H. Trybom, Detroit, Mich.

THE BUFFALO EXHIBIT.

THE exhibits made in connection with the Buffalo meeting of the Eastern Manual Training Association may well be reported under two heads, the pupils' exhibit and the manufacturers' exhibit. Owing to a number of causes, the pupils' exhibit was small compared with those of previous years. The executive committee had requested that this exhibit be made by means of photographs, and the only examples of actual work were from Akron, O., and Buffalo. Mt. Vernon, N. Y., however, sent mounted art work representing all grades, including the high school. Three panels of sewing, three of woodwork, and several folios of mechanical drawings illustrated the work of the Akron schools. This work is done in two periods of one and one-half hours each per month. The large display of the Buffalo schools consisted of photographs, panels, and original models; the photographs showed the group work of the lowest grades and representative rooms and classes at work; some fifteen panels were filled with cardboard, knife-work, bent-iron, and woodwork; original models, being made oftentimes at home, revealed the interest taken in the work, and an understanding of the principles taught through the regular models. Made of rich-toned red and green paper, and touched now and then with appropriate gilt and water-color decoration, the cardboard construction of the fifth and sixth grades was by far the most pleasing and progressive work shown. Manual training is optional in all but the lower grades, and the woodwork of the upper grades represented great freedom of choice on the part of the pupil as to models constructed. A characteristic feature of this work was the variety of the pupils' modifications of a general design, both in regard to structure and decoration. The work of a certain eighth-grade boy forcibly illustrated the contention of Colonel Parker, that what a pupil *can* do determines what it is *best* to give him to do. This boy had designed and made during the year a mitered picture frame, a hall bench, a table bookrack, and a lady's writing desk.

The remainder of the pupils' exhibit consisted of photographs: seven of rooms and work from Homestead, Pa.; nineteen from Hartford (Conn.) High School; twelve from Cleveland, O., showing work in all grades; and some fourteen from Teachers College. Among these last, an Indian village, an Esquimaux house and sleds, an Arab encampment, and a tournament of King Arthur's time were illustrations of special interest as showing examples of group work related to other school work of the lower grades.

The manufacturers' exhibit occupied rooms apart from the pupils' exhibit, and attracted fully as much attention as the latter. This exhibit was larger than any like one held in connection with the Eastern Manual Training Association, and its success should lead manufacturers to continue this important feature of the Association's annual meetings.

The exhibits of Ginn & Co. and D. C. Heath & Co. could but reveal the paucity of books of immediate interest and helpfulness to manual-training teachers. This field deserves the attention of publishers and men conversant with the needs and possibilities of manual training.

The large variety of nails made by the American Steel and Wire Co. was illustrated by samples mounted on cardboard and properly labeled. If these cards can be obtained in this form, they would prove a valuable addition to the furnishing of any woodworking room. A press drill and a down-draft forge were exhibited by the Buffalo Forge Co. Keuffel & Esser Co. had a case containing a variety of drafting instruments, scales, curves, slide-rules, pencils, and paper. Hammacher, Schlemmer & Co. placed one of their elementary desk covers where one could actually handle the tools and become convinced as to their adaptability to school needs. The tools commonly used on manual-training benches were displayed in a case. The Stanley Rule and Level Co. also showed a case of several planes, scales, gauges, spokeshaves, mallets, and try-squares. Mack & Co., of Rochester, N. Y., exhibited a case of the D. R. Barton edge tools. Their agent was ready to explain the merits of these tools and to take the names of those interested in receiving samples to test their superiority. The steps involved in the process of forging a carving tool were also illustrated in good form in a panel-case which can be supplied to schools teaching forging. Two of the W. C. Toles' rapid-acting vises were placed on a support in such a manner that their agent could readily demonstrate the working of this special vise.

The largest and most complete exhibit was made by Chandler & Barber, who also had an agent to explain their tools and equipment. A foot-power bandsaw for use in rooms where no other power is available was one of the features of their attractive exhibit. Other features were an adjustable bench, a set of printed drawings for Larsson's sloyd models, a compact outfit for a class of twenty in whittling, an equipment for a manual-training bench, and various publications relating to manual training and sloyd.

The type of problems relating to equipment which the manufacturers' exhibit helps to solve was illustrated by a device submitted by Mr. George Norton, of Philadelphia, which consisted of iron guides serving to increase the durability and accuracy of the common framed wooden vise.

HARRIS W. MOORE.

BREVITIES.

WEAVING and basketry as manual-training subjects were given great impetus in Chicago during the summer at two schools for teachers. At the University School of Education Miss Clara I. Mitchell conducted two large and enthusiastic classes of about fifty students each, and at the Prang Summer School Miss Bonnie E. Snow, assisted by Miss Helen Maxwell, gave instruction to about one hundred teachers and supervisors of drawing. Of the results in the latter school Mr. William S. Mack says: "The work was new to most of the students, but since the work of the class ended we have ample evidence that many of the special teachers and supervisors are going to substitute textile weaving in the elementary grades for much of the aimless puttering with paper-cutting and pasteboard exercises that have been given as busy work heretofore."

JOSEPH F. DANIELS has resigned his position as librarian of the State Normal School, Greeley, Colo., to accept a similar position in the Colorado State Agricultural College at Fort Collins. Here he will continue his work in library handicraft,

E. F. KIMBALL, who was an instructor in manual training in the eighth and ninth grades in Hartford, Conn., during the past year, has accepted a position in Fitchburg, Mass.

ALLEGHENY, PA., has two new manual-training equipments this year. Six of the district schools are now provided for. Mr. C. B. Connelly, the supervisor of manual training, is assisted by Mr. John T. Hawthorne, Mr. James T. Glenn, and two teachers of domestic science and art — Miss Mary A. Sanders and Miss Lucy H. Gillette. One new manual-training equipment is being added in Pittsburg this year.

AT Homestead, Pa., the contract has been awarded for the new manual-training school donated by Mr. Charles M. Schwab. The building will cost about $80,000.

IN Saginaw, Mich., the board of education was so well pleased with the results of the manual-training work begun last year in the fifth and sixth grades that it has voted to extend the work to include the seventh and eighth grades. Mrs. Ida Hood Clark, who introduced the work in sewing last year, will supervise both the sewing and the knife-work of the fifth and sixth grades. Miss Helen Westgate, from Teachers College, New York, will teach domestic science in the seventh and eighth grades, and Mr. J. R. Forden, from the University of Illinois, will teach woodworking in the same grades.

GRAND RAPIDS, MICH., adds four new teachers of manual training to its force this year, making a total of ten, of which Mr. George S. Waite is the head. The four new ones are: O. L. Whitcomb, shop-work; Miss Fleta Paddock and Miss Eleanor Temple, cooking; and Miss Helen J. Torey, knife-work.

FOSTER H. IRONS has left Saginaw, Mich., to take a larger field in the South. He has gone to Nashville, Tenn., to become supervisor of manual training. He will be assisted by Miss Bessie Randall, from Toledo, O., who will teach cooking in the seventh and eighth grades. Mr. Irons's first work will be to equip rooms for the upper-grade work; later he will begin normal work with the lower-grade teachers.

MASSACHUSETTS.

THE natural growth of interest in manual training in the public schools of Boston has resulted in the employment of two additional teachers.

WORK on the new Brookline manual-training high school has fairly begun.

INTEREST in the handicrafts has taken hold of the summer boys' camps scattered through the lake regions of the coast. Camps Algonquin, on Lake Winnepesauki, Pasquaney, on Newfound Lake, and Idlewild, near by, all have shops with some directing hand in charge. Camp Asquam, under management of Dr. W. T. Talbot, and located at Holdeness, N. H., on Lake Squam, has a large shop with steam power and power drill-press, grindstone, emery wheel, buzz planer, saw table, etc. A lathe and jig saw are contemplated. A blacksmith shop contains a forge and proper tools. Next summer the bench epuipments will be ten in number, and a competent instructor will conduct courses in woodworking, light and heavy bent-iron work, cardboard construction, and possibly basketry.— JOHN C. BRODHEAD.

AN interesting feature of the manual-training work at North Adams, where Mr. Charles H. Stearns is supervisor, is the development and construction of a variety of miniature looms for use in the school. Each pupil is encouraged to think out and then make a loom better than any he has previously used for the kind of weaving he

has to do. It is now proposed that larger looms be constructed which may be used in weaving hangings for the schoolroom.

CALIFORNIA.

THE Cogswell Polytechnic College of San Franscisco has been somewhat reorganized, with a new president from the East. Mr. Leonard E. Davidson, normal graduate in manual training and B.S., Throop Polytechnic Institute, has been appointed instructor in wood, iron, and machine shops.

MISS ELSIE WHITMAN, last year at Claremont, will supervise drawing, manual training, and music in the Covina High School.

CHARLES H. WRIGHT, instructing last year in the Phœnix (Ariz.) Indian School, and formerly connected with Throop Polytechnic Institute, has left the field of teaching and taken up architectural work in Boulder, Colo. Mr. M. Friedman, of Cincinnati, is now in the Phœnix school as head of the manual-training department.

MANUAL TRAINING has been placed in the fifth year of the schools in Los Angeles county, work now being carried on in the first five grades. Part II of *Educative Hand Work Manuals*, paper and cardboard construction, by Arthur H. Chamberlain, has been adopted for use.

MISS EMMA RUSSELL, class of '98, has been appointed assistant in sloyd at Throop Institute.

THE second annual summer session in manual training at Throop Polytechnic Institute closed a most successful term August 3. Sixty-seven teachers were in attendance. They came from widely divergent localities; central and northern California, Oregon, Arizona, New Mexico, and the Hawaiian Islands being represented.

RIVERSIDE, Pomona, and Pasadena are contemplating the introduction of manual training this fall. Tulare and Visalia will no doubt soon offer work in manual lines.

MISS EDITH PARRISH, supervisor of art work in the schools of San Bernardino, will also supervise the manual training which is being introduced this year.

MR. WALTER A. TENNEY, formerly supervisor of drawing and manual training at Fresno, succeeds Mr. Ronald P. Gleason in the Oakland Manual Training School.

MR. F. A. WAGNER, principal of the Redlands school, last year introduced manual training into his school, giving the instruction himself. This year Miss Edith A. Woodsune will teach the manual training. She is a graduate of the State University, also of the California School of Mechanical Arts.—ARTHUR H. CHAMBERLAIN.

BOTH the Wilmerding School of Industrial Arts and the California School of Mechanical Arts, the latter founded by James Lick, were established for the purpose of teaching trades. When it was decided that the Wilmerding School should be located in the city of San Francisco, it became apparent that the efficiency and usefulness of these two institutions would be enhanced by a plan of co-operation whereby they would be made to supplement each other as far as possible and avoid duplication of courses and equipments. The Lick School having made provision for a complete series of machinery trades — pattern-making, molding, machine-shop work, forge-work, and machinery drawing — it seemed advisable for the Wilmerding School to devote its efforts more particularly to the building trades.

Following the death of Mr. Schwartz, the Wilmerding School Committee of the Regents of the University decided to carry this plan of co-operation still farther by

placing both schools under the management of the same head-master. Upon the approval of this action by the Regents, Mr. George A. Merrill, principal of the Lick School, was elected director of the Wilmerding School, his services to be divided between the two institutions. This arrangement, however, does not imply or contemplate any merging of the two trusts. Each institution will preserve its identity and complete independence, and the character of instruction in each will be such as the founder prescribed for it in the terms of his bequest.

NEW YORK CITY.

THE value of manual training in philanthropic work has again been demonstrated in the Vacation Schools of Manhattan and the Bronx. These have successfully completed a six-weeks' course under the direction of a committee of the Board of Education, with Dr. A. T. Schauffler as chairman.

The average daily attendance at the schools was 5,884, an increase of about 20 per cent. over that of last year. Of this number it is estimated that about 1,000 attended regularly throughout the course. A feature of this summer's work was the prominence given to drawing, every pupil who used a drawing in any of the industrial courses being required to make it himself. It was found that this had the effect of diminishing the ardor of the students in some degree, as they thought it too much like school. The school buildings and teaching staff provided were found ample for the numbers willing to take advantage of them. The work, on the whole, was regarded as satisfactory; though a lack of experience on the part of many teachers (most of whom were recruited outside of the regular city staff), added to the irregular attendance of the pupils, of course operated as a hindrance to the attainment of the best results.

Besides those in the Vacation Schools, many thousands of children were brought under the influence of good teaching and healthful recreation in the playgrounds, which were under the management of the same committee.

THE rapid growth of the school population of Greater New York is indicated, not only by the growth of new high schools, but by the establishment of high-school "annexes." South Brooklyn is to have two such annexes this fall, one being a branch of the Manual Training High School. Only the lower classes are to be accommodated, and the manual work, in charge of Edwin W. Foster, is to be entirely woodwork, no metal-working equipment having been provided. A change in the course of study allows but six fifty-minute periods weekly, and the benchwork will now extend throughout the first year instead of simply the first half-year as formerly. The amount of time spent at turning is also to be reduced, the turning work to be incidental to and included in the pattern-making.

AT the annual meeting of the Manual Training Teachers' Association of this city, held June 21, the following officers were elected for the ensuing year: president, F. J. Foster, P. S. No. 79; vice-president, W. F. Vroom, P. S. No. 5; secretary, A. W. Garritt, P. S. No. 30; treasurer, H. Peyser, P. S. No. 77.

LARGE and enthusiastic classes in primary- and grammar-grade manual training were a feature in the summer school of Columbia University. In the former class simple weaving, basketry, cordwork, paper and cardboard work, bent-iron work, and elementary wood-working were presented.

THE manual-training graduates of this year's class at Teachers College have secured positions as follows: Oscar L. McMurry, director of department of manual

training, Chicago Normal School; Elmer H. Willmarth, high school, Indianapolis, Ind.; Louis A. Bacon, elementary schools, Indianapolis, Ind.; William A. Sargent, elementary schools, Detroit, Mich.; George L. Lewis, elementary schools, Hartford, Conn.; Lewis B. Battey, State Normal School, Millersville, Pa.; Merit L. Laubach, Wilkesbarre, P.; Miss Anna B. Gausmann, East Orange, N. J.; Miss Ada F. Blanchard, elementary schools, Los Angeles, Calif.; Miss Elizabeth B. Pierson, primary schools, Utica, N. Y.; Miss Lucy A. Linville, elementary schools, Atlantic City, N. J.

ROCHESTER, N. Y.

MANUAL TRAINING is taking a long step forward in Rochester. Instead of developing work in the public schools independent of what has been done at the Mechanics' Institute, the Board of Education has wisely appointed Professor W. W. Murray, of the Institute, supervisor of manual training in the grade schools. Still retaining his position as director of manual training in the former institution, he will be able to shape the work in Rochester into a unified system. The new plan for manual training covers the entire school period, beginning with the kindergarten and ending with the secondary school. The course at present is provisional, but Mr. Murry's statement of it, as it appears in the printed course of study, is significant. It is evidently his purpose to bring the manual training into close relationship with the work in other subjects, so that it may become an organic part of the child's school and out-of-school life. We quote the following:

"The children of the first, second, third, and fourth grades will work in clay paper, cardboard, wood, the materials used in weaving fabric, and cane weaving. The children of the primary grades will be provided with wood cut into a variety of widths, which will enable them to construct toys and useful objects of an interesting nature. This work will involve the use of measuring rule, try-square, saw, saw boxes, hammer, and nails; and such exercises as measuring, squaring, sawing, occasional whittling, assembling of parts, testing and fastening. The aim being to bring into use the larger muscles, and to reduce the use of the finer muscles to the minimum, the articles made will be simple and capable of being finished in a short time. Many of the pieces will be made for and used at the sand table for the purpose of building and fitting of huts; wigwams; log-houses; modern houses; villages; manufacturing towns; and cities. Also lines of communications — as telegraph or telephone lines, bridges, boats, cars, stations, etc.

"In the fifth and sixth grades the constructive work will be done in the regular class-room, each pupil being provided with a desk-tray, which contains the outfit of tools. It covers the top of the desk and will be used both as a drawing board and a work-bench. For the constructive work in these grades the pupils will use materials for weaving fabrics and baskets; and cardboard and wood for the construction of useful articles for the home, school, and play life, such as boxes; covers for written work; portfolios; small baskets; and objects involving the use of leather, cloth, and wood, illustrating the evolution of simple implements used in the industries. Each pupil will be provided with a measuring rule, compasses, T-square, triangle, and try-square. For general use there will be hammers, several saws, gimlets, an oil stone, oil can; and a cabinet in which to keep the equipment for each school.

"The work of all of the seventh, eighth, and ninth (the ninth grades as long as they are continued) will be done at the five manual-training centers. The 'centers' will be equipped with work benches, and each bench will be fitted with a small set of tools. Besides the individual set of tools at the bench there will be others for general use and special work. The pupils will construct objects in which cloth, leather, brass, copper, tin, Venetian iron, and several kinds of woods will be used.

"The sequence of models will be governed largely by the needs of the school life and other interests of the pupils.

"The work becomes the property of the pupil as soon as the object is completed. Special arrangements will be made with the pupils for work to place on exhibition.

"In the course, throughout the grades, all possible latitude will be afforded the pupils for the use of individual ideas regarding the object to be made, and its form, size, and decoration. Changes will be made both in material and methods, wherever and whenever it is discovered that added interest or better results can be secured for the child."

THERE are several changes in the teaching staff at the Mechanics' Institute this year. Mr. George L. Colburn, formerly of Cleveland, is to have charge of the machine shop. Mr. William A. Robbins, for several years supervisor of manual training at Passaic, N. J., has been appointed an instructor in woodwork. Mr. Charles Stone, who has been the teacher of forging during the past three years at the Institute, has sailed for the Philippines to take charge of the forging in the government school located in Manila.

IT is not necessary to sacrifice academic work in order to introduce manual training. There is no good reason why the program of studies in a manual-training high school, so far as academic work is concerned, should differ from that of any other high school, provided always that the school is to be conducted as a high school, and not as a technical or trade school. On the other hand, there is every reason why the same scholastic work should be required and may be done in a manual-training high school the same as in other high schools. In a program of thirty periods per week the pupils in a manual-training high school can carry the same course of academic work as those in other high schools, and do the manual training besides. This has been demonstrated in Denver, New Haven, Indianapolis, Kansas City, Philadelphia, Brooklyn, in the Teachers College of New York, and in many other places. An experience of twenty years in secondary-school work, seven of which has been in a manual-training high school, has taught me that students carry the course quite as easily as in any school.—CHARLES D. LARKINS, in *Journal of Education*.

MANUAL TRAINING AT THE PAN-AMERICAN EXPOSITION.

THE glorious achievement in harmonious coloring of great buildings, the plentiful use of strong sculpture, and the magic effects of the grand illumination are features of the exposition which are already familiar to every reader. Certainly everyone who has been to the exposition has felt that pride which every true American must feel in the excellence of the well-ordered exhibit of the United States. The charm of "Little Venice," too, may have pressed itself upon him while on the canal which encircles the group of beautiful buildings forming the heart of the exposition. To dwell upon these, and other interesting and important features, would be a delight which the limited purpose of this paper will not permit, for it must deal with exhibits which lie within the field of manual-training interests.

But the exhibits which come within this field were many; they kept appearing in most unexpected places. In the forestry building, what beautiful woods for beautiful models! What interesting specimens to tell the boys about! A pine log as big as a freight car, a timber of Oregon pine thirty-four inches square and seventy-two feet long, planks four and five feet wide, "knees" of Louisiana cypress, burls for curly veneer, and an inlaid checker-board table containing over twelve thousand pieces — these were some of the novel things to be seen in the forestry building.

In various Indian exhibits one found rich suggestions for weaving and basketry and group work for the lower grades. That the Indian can achieve success in other than these primitive occupations was shown by the excellent exhibit from the Carlisle

(Pa.) school. In this school the manual-training work necessarily conforms closely to the trade idea, and many of the models were finished with skill like a journeyman's. In that most interesting Philippine exhibit, in the government building, were many small, crude tools, and rude models of houses, furniture, dress, utensils, and implements. The cannon used in war against our soldiers were, some of them, made of big pieces of gas pipe wound with bamboo, and mounted, or not, on rough carriages having wheels made of boards nailed together as a boy would do it. More skill, however, was revealed in the inlaying of pearl-shell in a hard-wood table, and in the application of a spiral groove to a drill-brace.

In the tools and machines of domestic manufacture one found the summit of excellence. Among the saws were some big enough to saw those mighty trees of Oregon, one of the circular saws being eleven feet in diameter. Here were found chisels and knives of all shapes and sizes; also grindstones, and stones of emery and carborundum. In another place were wood-fillers, stains, polishes that shone like glass, and a house built of fossil gums which are used in making varnishes.

Artistic furniture of simple lines and pleasing proportion was found, notably in the exhibit of the National Arts and Crafts Club. Here were displayed a few chairs, stools, benches, and boxes, whose name, "mission furniture," suggests the hope of the designers that it will lead to a demand for furniture of simple beauty and honest construction. The furniture of one of the exhibits in the Graphic Arts building also attracted the æsthetic eye; it, too, was characterized by simplicity and honesty. Its somber black oak was enlivened by bright red leather and shining brass nails, till the whole effect was a pleasing symphony of black and red.

Leaving now these many displays, which are interesting because of their suggestiveness, mention should be made of the purely manual-training exhibits in foreign buildings, state buildings, and in the educational section of the Liberal Arts building. From the school work shown in the Honduras building one would infer that girls only received instruction in handwork, for the exhibit consisted mostly of elaborate needle-work, crocheting, knitting, flower-making, millinery, and dressmaking. There was, however, some simpler work in the line of mats, dolls, and samplers much like those our grandmothers used to make. A number of crayon drawings were shown, several of which were by the same student. These drawings were from standard casts or copies, and were finished with a nicety comparable to machine printing.

In the Mexican building one found samples of raffia and other fibers which would delight the primary teacher. From the National School of the Blind and the Normal School of Mexico came beautiful lace and Mexican work, dressmaking, and elaborate embroidery.

As one entered the only state building which contained exhibits, the fragrance of Minnesota's broad prairies was borne to one from the rustic furniture and woven-grass carpets. This building contained an extensive exhibit of art students' work, drawing, school work, manual training, and photographs of well-equipped colleges and normal schools. Surely Minnesota's exhibit could but appeal to the pride of her every citizen and enlist his cordial interest in every movement tending to advance the blessings of popular education. In the state schools for the deaf, the blind, and the feeble-minded manual training is of a diverse and individual character, and with the older pupils it is carried into trade lines. Made by these deficient pupils some of the work was crude, while some, notwithstanding deficiencies, was really excellent. The St. Cloud schools showed weaving, crocheting, raffia-work, slip-work, and sloyd; the

Red Wing Training School, sloyd and forging which contained many good farm models; and the St. Paul high schools the usual manual-training courses of a rather formal nature. The sloyd, art work, and high-school manual-training work of the Minneapolis schools were of the usual type, but of exceptional merit were the weaving and basketry of the lower grades, some of the baskets suggesting those excellent ones of the Indian exhibits.

The educational section of the Liberal Arts building was a vast storehouse of information regarding the work done by one hundred or more cities, schools, colleges, universities, or societies making exhibits. That which was merely visible to the casual visitor formed in reality but a small part of the exhibit, which was made up of wing-cases containing photographs, charts, and mounted work, of panels containing models, and of bound volumes containing written work, drawings, documents, and reports. Much of this exhibit, being in such a permanent form, will prove a valuable possession to the various exhibitors. The exhibits were classified according to the grade of the student, with the kindergarten as the lowest and the university the highest stage in his educational career. Because of this classification the visitor was obliged to look through several alcoves to find all the manual training carried on in a single city.

Since specific mention of each manual-training exhibit would result in a wearisome repetition, it will suffice to note general characteristics and signs of progress. Though it is a pleasure to observe that the work of those schools to which we have looked for ideals is still the best and far beyond that of many public schools, yet many others have, indeed, progressed so far as to approach within worthy comparison of these ideals. A growing tendency to embody artistic principles in manual-training models is recorded with pleasure. This tendency finds its latest manifestation in the application of water colors to certain models, usually made in slip-work, so that really artistic calendar backs and picture frames take the place of the former crude, uncolored models. Most of the exhibits displayed a degree of accuracy and a nicety of finish which would please the most critical.

If diversity means life, then manual training is very much alive, for the diversity of courses was nearly co-equal with the number of schools from which they came; yet in all this diversity the broad outlines of manual training suitable for the different grades seem quite distinct, especially toward either end of the child's career. The period of transition from the primary to the grammar grades is still the least definite. Is not this the time when the growing boy wants to do bigger, coarser work than the school can yet supply? Another healthy reason for this diversity is found in the evident play of individual choice in the models made.

In private and philanthropic institutions manual training evidently merges quickly into trade lines, for, in exhibits from such institutions, articles of apparel or of use in various industries were frequently seen. The growth of interest in trade instruction was also indicated by the exhibits of the two textile schools of Massachusetts, the Technical School for Carriage Builders in New York city, the New York State Industrial School, the Philadelphia School of Industrial Art, and the School of Trades, which is a department of the Springfield (Mass.) Mechanics Arts High School.

Manual training worthily occupied its prominent place in the educational exhibit of the Pan-American Exposition. To one who realizes the significance of its deeper lessons, and of its liberating influence upon the educational thought of the country, the future seems bright with promise. HARRIS W. MOORE.

EDITORIAL.

The present number of the Manual Training Magazine is issued in a somewhat new form, with the thought that such a concentration of related material will be of more assistance, both to the general reader and to a large body of special workers, than the same material spread over a number of issues.

The question of handwork in the primary grades is in many ways at the very bottom of the whole question of manual training in the schools. It is here that such work has its greatest need and its greatest influence as far as child life is concerned, and it is here that its relations with the other school work can be most clearly seen. It is in this field, on the other hand, that the whole subject is most free from tradition and prejudice, and where it can be approached and developed in the light of modern educational thought with the most hope of a natural and healthy outcome.

The organic relations of manual expression with the life of young children are so evident and so emphatic that many things are forced upon the attention with such pupils that often escape notice with older workers. This, and the fact that the actual results from young children count for so little, tends to a close and searching study of method in this field, and finally to a clearer view of the whole subject of manual training as an educational instrument. It is also true that in the matter of appreciation by the teaching public the manual-training movement has more to gain through the general introduction of handwork in the primary grades than through any other source. For the moment the grade teacher begins to use handwork intelligently and naturally as an element of school instruction, that moment the work leaves its isolation, and an appreciation of the true office of school handwork begins that cannot but lead to new conceptions and a truer understanding on the part of all teachers.

For these reasons it is not too much to say that the primary school is at the present time the strategic center of the manual-training movement, and that the spirit and success which attend the efforts to extend handwork in this direction will undoubtedly have a vastly important influence upon the spirit and methods of the work in all other derpartments.

C. R. R.

If this number of the Magazine should prove to be particularly helpful to any of our readers, they should remember that it is due in large measure to the efforts of Professor Charles R. Richards, of Teachers College, New York, who urged the importance of publishing such a special number on primary-school work at the present time and later rendered exceptionally valuable service as co-operating editor. In harmony with the Magazine's established policy of giving credit to whom it is due, the editorials written by Professor Richards appear over his initials.

The present attitude toward the ideas of logical sequence and self-expression in manual-training work and some of the misunderstandings in relation thereto were very forcibly brought out in the discussions on the first and second days of the Buffalo meeting of the Eastern Manual Training Association. Throughout the discussion the horror of the orderly mind at anything savoring of lack of system and thoroughness was constantly in evidence, and the apparently irreconcilable antagonism of the two ideas was at first sharply defined. But by dint of pegging away at practically the same point for two days the parties to the discussion came gradually nearer together, and a much clearer view upon the whole matter was finally evolved. The point was effectually developed by Colonel Parker that organization of work upon the basis of a logical sequence of difficulties was logical in everything except a recognition of the nature of the worker, and that motive and interest are factors that must be taken into account if any sequence is to be truly "logical."

Another point that was pretty well thrashed out is the idea that the introduction of the element of self-expression does not mean turning over the work to the whim and caprice of the worker, but, on the contrary, means far more forethought and care on the part of the teacher than any set scheme of work, and, furthermore, that the only sane fashion in which the pupils' own thought and feeling can be profitably brought into manual training is in a manner adjusted to the thinking and feeling power of the worker, or, in other words, under definite and carefully prescribed limitations. That this element constitutes an essential part — indeed, the very heart — of all truly educative handwork was pretty thoroughly established, and the discussion ended with the apparent acceptance of the fact on the part of most of those present that the question of compassing work in this spirit is one of the problems before the manual-training teacher.

C. R. R.

THE following communication has been received:

Mr. Editor: In your editorial of the July number of the MANUAL TRAINING MAGAZINE you have given a very careful analysis of the educational phases of my monograph on *School Architecture and Hygiene.* While, in presenting the different types of school buildings, the real educational meaning of these types was brought in incidentally, I was much gratified that you, in your careful reading of the monograph, discovered and separated this thread from the more material and conspicuous part of the work. I take no exceptions to your editorial, and am glad to say that I agree most fully with your conclusions, as set forth in your closing paragraph. I am, however, inclined to believe that my use of the term "*par excellence*" was not quite understood. By this I was not speaking of the future, but of the present. The "*par excellence*" of today is simply the embodiment of the last and best which we have been able to realize in the evolution of types. The growth which I tried to outline, and which you so carefully reviewed, almost presupposes that it will be continuous. Words representing ideas can only be taken relatively. The term "*par excellence*" means nothing except as it symbolizes needs as at present discerned. The "*par excellence*" of a century hence we could not appreciate as such today. It would not meet the needs of the present hour.

I wish here to say that the term "manual-training high school" is very misleading when applied to the best modern type. It is a name which seems necessary more to distinguish it from the older type of school than to describe or characterize it. The incorporation of manual training into the high-school curriculum does not justify the present name any more than the incorporation of natural science several years ago justified the name "science-training school." Yet the present name seemed to be a necessity.

As you truly say in your editorial: "The high school *par excellence* for a large city would be, not a manual-training high school, or a Latin high school, or an English high school, or a commercial high school, but a broad, general high school, covering the fundamental lines of instruction in all these, and carrying each as far as the conditions make it possible and desirable."

As to technical and specialized work in secondary schools, let it always be held in mind that, while the student cannot specialize in the true sense of the term, nothing is more vital or important than that the work in all departments should be in the hands of the specialist, for it is only he who can bear the torch in such a way as to furnish the student with the necessary light — necessary to a proper selection. It is only he who knows how to give the beginner what is really vital to the subject. Everybody knows that one hour with a specialist aflame with his subject has more of general educational value than has a week with the so-called "broad teacher," who is really without knowledge and without spirit.

GILBERT B. MORRISON.

KANSAS CITY, MO.

REVIEWS.

THE following published material is recommended as of special value and suggestiveness to grade teachers and manual-training instructors interested in primary work:

The Elementary School Record. Nine numbers. Published by the University of Chicago Press.

The Course of Study. Published by the Chicago Institute.

Teachers College Record, No. 5. Published by Teachers College, New York city.

"Constructive Work in the Elementary School." G. E. English. *Proceedings National Educational Association*, 1899.

It should be borne in mind that the specific work described in any of the above can be considered only as suggestive, and that such work, for the most part, would require modification for public-school conditions and adaptation to the requirements of each particular school.

The following matter is recommended as of special value in regard to materials and processes:

How to Make Baskets. Mary White. Doubleday, Page & Co., 1901.

First Years in Handicraft. W. J. Kenyon. The Baker & Taylor Co., New York, 1901.

Raphia and Reed Weaving. Elizabeth S. Knapp. Milton Bradley Co., Springfield, Mass., 1901.

Manual Training for Eight Years. Carter and Roosevelt. State Superintendent of Public Instruction, Denver, 1898.

"Constructive Work in Paper for Primary Grades." J. C. Cremins. *New York Teachers' Magazine*, Vol. V, pp. 195, 271, 372.

Le Travail Manuel. Bertrand, Toussaint et Gombert. Lacène, Paris, 1890.

Cane Basket Work. Annie Firth. L. Upcott Gill, London, 1899.

C. R. R.

Indian Basketry. By George Wharton James. Published by Henry Malkan, New York. 9¼ × 6 in.; pp. 238; price, $2.—This book is a mine of information to anyone who is interested in basketry. The book is the result, as the author tells us, "of twenty years' personal observation and study among the Indians of our Southwest, much correspondence and questioning of authorities, and the reading and culling from every known source of information." It contains 300 illustrations, many of which are half-tones made from excellent photographs. Some of the chapter headings will serve to suggest the scope of the book: "Basketry the Mother of Pottery;" "Basketry in Indian Legend;" "Basketry in Indian Ceremonial;" "Basket-Making People;" "Materials Used in Indian Basketry;" "Colors in Indian Basketry;" "Weaves and Stitches;" "Basket Forms and Designs;" "Symbolism of Indian Basketry;" "The Poetry of Indian Basketry;" "How the Art May Be Preserved." One cannot even look at the pictures in this book without a glowing interest in the art of the Indian basket-maker.

Familiar Trees and Their Leaves. By F. Schuyler Mathews. D. Appleton & Co., New York. 8×5¼ in.; pp. 320; price, $1.75 *net.*

Insect Life. By John Henry Comstock. D. Appleton & Co., New York. 8×5¼ in.; pp. 350; price, $1.75 *net.*

These are new editions in colors of two books which have already won high places among books on nature study. Professor Comstock's book is a text-book and guide of the highest order, and Mr. Mathews's is a popular book with nature lovers who wish to study trees and their foliage.

Familiar Trees contains twelve colored pictures of representative trees. These have been reproduced from water-color studies by the author. It also contains line cuts from over two hundred drawings from nature. *Insect Life* has twelve excellent colored plates reproducing moths, butterflies, beetles, and caterpillars in their natural colors. Added to these are numerous wood engravings scattered through the text.

These are just such books as one wants to take to the woods and fields for reference when he goes away for his summer vacation. Certainly every teacher of woodworking should be able to distinguish all the common trees of the forest, and Mr. Mathews's book will help him to do it.

Studies from the Yale Psychological Laboratory, Vol. VIII. Edited by Edward W. Scripture, Ph.D. Price, $1. Obtainable at Psychological Laboratory, New Haven, Conn.— This volume contains: (*a*) a safe test for color vision, by E. W. Scripture; (*b*) researches on movements used in writing, by Cloyd N. McAllister; (*c*) researches in cross-education (second series), by Walter W. Davis; (*d*) computation of a set of simple direct measurements, by E. W. Scripture.

The following have been received:

Files and Rasps. A convenient little catalogue of files issued by Hammacher, Schlemmer & Co., New York, to which is appended "Hints and Suggestions as to the Proper Method of Using Files."

Outline of Hand-Work for the First Four Grades of the Los Angeles County Schools, Los Angeles, Calif. By Arthur H. Chamberlain and Genie A. Hunt.

The Spry Vacation School. A circular giving in outline the daily work of the school from July 8 to August 10, 1901. Henry S. Tibbits, principal, Chicago, Ill.

Tenth Annual Catalogue of Throop Polytechnic Institute, Pasadena, Calif. Contains announcement of normal department of manual training and illustrations of manual-training models.

Circular of Information, Mechanics Institute, Rochester, N. Y., for 1901–1902.

Course of Study. Public Schools, Rockford, Ill., including an outline of course in manual training through the eight grades of the elementary schools.

The Schools as Related to Institutional Life. A report to the Association of City and Town Superintendents of Indiana.

MANUAL TRAINING MAGAZINE

JANUARY, 1902

THE THOUGHT SIDE OF MANUAL TRAINING.

ARTHUR W. RICHARDS,
The Ethical Culture Schools, New York City.

I.

IT is very generally understood that manual work is in our schools in the interest of no special art, trade, or vocation, but in the interest of an education which aims to develop human faculty and power, and unfold to the growing mind and consciousness the achievements and motives which have moved man ever toward better things. Less generally understood is the part in such an education which the manual training should play. Roughly speaking, manual training stands for hand-and-brain work. The part it should play in our education is the counterpart of that played by hand-and-brain work in the progress of civilization. Education is for life, life for service, service to further the progress of man. Therefore, in the forces which in the past have made for the progress of man, may we not with some reason expect to find master-forces of education ?

Our manual-training practice has been evolved from various points of view, all, however, aiming at faculty and power, but doing little toward unfolding to consciousness the achievements and motives which have raised man to his present state. This practice has been chiefly concerned with some exterior aspect of the work — as the joint construction of the "Russian system" or the useful article and systematic gradation of tool exercises of the "sloyd system." It is rather difficult, however, to see how these touch vitally those realms of the imagination and intellect which have been opened up to man by the joint action of hand and brain. No line of action, however systematic, which is dissociated from its natural world-bearings can be of the highest value in giving to an individual his bearings in this world of

progress and work. But it is just this that is wanted — the natural bearings of our manual work upon vital human or world interests.

The motive thought of manual training has not yet attained its full content. That something is deficient, and that there is a general agreement concerning only minor issues of the question, seems to be indicated by the general uneasiness and lack of any definite movement toward the solution of the question of the relation of manual training to other work. Such stress has been given to this matter of the relationship of work that the chief business often seems to be to manufacture a subject-content for manual training for the sake of some external relation or contact, and this, too, regardless of the natural content of the real subject-matter. Now, if manual work is something of real human concern, and is necessary for the expression of man's full life, does it not seem that, had we the complete and adequate central or motive thought for our manual work, its expression in accord with this motive thought would lead to and touch vitally other world affairs in a natural, unstrained way ?

As already suggested, this motive thought could hardly be some incidental aspect of tool-work, but must be commensurate with, and adequately represent, the relation which the handwork of man has maintained in his whole spiritual, intellectual, and material progress. Handwork in the school, dissociated from those natural interests and purposes which have been its constant and depending associates in the history of man, fails to realize its full function and liberalizing power. The realization of this constitutes the manual-training problem.

The proposition is not new that the arts of industry furnish the natural motives for our manual-training practices, but the far-reaching significance of this proposition the workers for manual training have hardly grasped. The arts of industry furnish a motive thought, and answer as nothing else the requirements for a basis for the manual work in our schools, because, more adequately than any other division of human activity, they represent that which has been evolved by the joint efforts of brain and hand ; and further, having been evolved as a vital and associated element of human life, they relate naturally and vitally to all that is of human concern, and therefore to all matters with which the school should be concerned. It is, then, a matter of realizing through our handwork somewhat of these vital and larger relations. Hand-tool work alone is not enough, and alone it has played no large part in human progress, but associated with real mental stress and intellectual desires it has worked wonders in the life of

man. It is the thought, the informational, the objective side of our manual training which needs adjustment — perhaps reconstruction. Dr. Dewey says :

> The assumption that a training is general just in the degree in which it is good for nothing in particular is one for which it would be difficult to find an adequate philosophic ground.[1]

Now, this is not much amiss when applied to our manual-training practices of the past ; for, in the attempt to be general and avoid the accusation of teaching any specialty, we have taught tools, methods, exercises, courses, and other harmless things. Very little has this tool-work been concerned with the human interests which have evolved the tool.

It is beyond the scope and intent of this paper to deal with the arts of industry in relation to manual training in any exhaustive manner, but it is purposed to discuss some of the important questions involved, with a desire to suggest rather than to affirm, the intent being to counteract the somewhat negative attitude of manual training in some directions, and further its adjustment as a positive and vitally related element of the work of the school. More in this than in any past age is there much in the arts of industry which is of concern to that stage of development in which the individual is becoming more partial to realities and more consciously selective of his environment.

We have heard much concerning the importance of the early years of childhood, of the care and consideration they should receive. This is all excellent, but has the importance of the age which follows — its treatment and significance — been sufficiently emphasized ? Truly all ages are important; more particularly their differences concern us here. In the earlier age the interests and purposes are largely controlled and determined by environment, even a momentary and improvised environment sufficing to regulate these. At this time the environment is sufficient and satisfying. Following this age, gradually there emerges one during which more and more is required of an environment to satisfy, and less and less does it satisfy. Then the spirit seems to be reaching out and away from the immediate self and its environment, seeking, as it were, glimpses into its world of action — perhaps also seeking nurture and kinship for the inner nature not yet defined. The earlier age is a time of negative activity — a reflex of environment ; the later, an age of positive activity and a reflex of

[1] *Educational Review*, May, 1901.

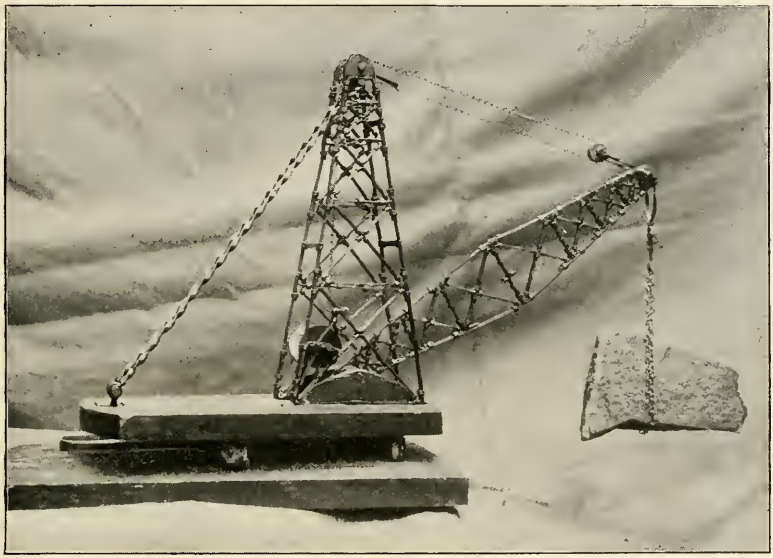
an inner nature — personality. This later is an age in which the life-bent of personality begins to appear — truly from the nurture of the important earlier period, but surely from this time on — shaping more and more the direct, positive, and conscious relations which will be woven into the fiber of life. The first age might be represented as the young, straight, and tender shoot that will become a tree; the later age, as the older sapling which begins to show definitely the branches, yet undeveloped, but which ultimately will characterize the tree. Now, it is precisely because of these direct, positive, and conscious relations that this age is of such great concern to us, and at no time of the school life is there more reason for fear and trembling. It is the age when personality gets itself together sound and wholesome, or goes to pieces weak and wretched, as is revealed so much more positively in this age than in the earlier. More than the earlier this age "makes (determines) the man." In it childhood is linked to adult life and purpose, and in it are formed the images and purposes of adult life.

Although academic discussion has placed the selection of life's work far along into the "teens," with the ultimate intent of pushing it beyond the college graduate and post-graduate career, this discussion was begun rather late, so that as yet it has made little headway against the impulses and instincts organized into human nature by the severely unacademic past. Even assuming there is much that is tenable in the academic stand toward vocation, we yet have these impulses and instincts still active and vigorous at an early period in life, craving action in contact with the world's work.

It may be seen, perhaps, that the two threads of thought thus far spun are about ready to twist together, *i. e.*, the thread concerning that age which seems to crave kinship with the world's work, and the one concerning the arts of industry which represent the world's handwork. It is plain that the industrial activities so characteristic of our time spring from instincts and impulses knit into the very fiber of human nature, and are sure to leave some permanent and important marks upon our institutions, motives, and activities. Nor should these be ignored more than gravitation. In the higher institutions of learning recognition is given to these matters by increasing attention to all lines of economic study. But what is there in these matters which bears imperatively upon the problems of the formative age already discussed — that age in which are formed the images and motives of adult life?

Probably the greatest motive which has caused the great industrial

progress of the recent past was that of "gain," though much, of course, could be said for better motives. Perhaps the first great thing to come from the industrial stress of our time is a large contribution to the "gospel of work" at the expense of the "gospel of gain." Signs are not wanting to indicate this possibility, and these both from the side of the worker and that of the gainer. But these must be left for the reader to fill in as he sees them. This "gospel of work" in its mani-

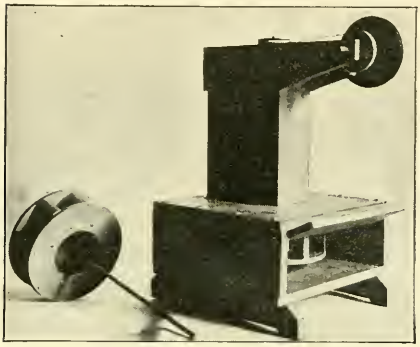


A STUDY IN CONSTRUCTION AND MECHANICS.

fold bearings perhaps could well be given first place as important unfinished business handed over from the last century. We are not, after all, in great need of more knowledge and science, with their concomitant comforts to mind and body, but we are in great need of such comfort as would come into the world by a just treatment of workers and the adjustment of the various problems involved. This, however, depends more upon the universal touch with that knowledge and science which we already have than upon its increase. Kinship with the world's work and workers could fairly be one of the large, if not the largest, concern of manual training in the school, if what it involves be realized. Not that hand-and-tool work covers this matter of world's work and workers, but that it stands for a large measure of

that which is the general nature and idea of work, and more particularly that kind of work most normal to the age here considered.

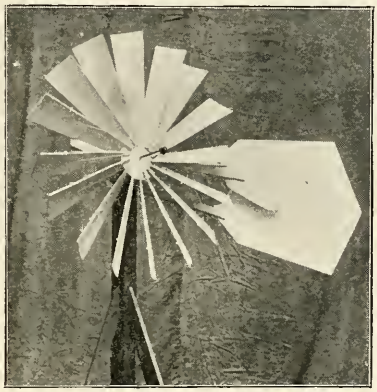
The subject of geography as now treated would hardly be recognized as geography by one of the old school not in touch with the present school work, so much is it industry, civics, commerce, etc. And as one follows the practices in the subject, he will be greatly pleased with the field and industrial excursions. Still this is but observation in the larger book of things—valuable, indeed, but observation is never experience of a vital order. The child may look over the great achievements in the world's work and yet, lacking real experience in achieving himself, be quite inadequately prepared to grasp and feel such achievements as a work of human hand and brain. Observation stops just short of this vital experience which adds so much to the human significance of things, and which contact is of no small meaning to the age here considered. It is here that manual training finds a large work, and into such associations brings the vital element of human experience and touch. In the interests of what would be a fair mental attitude at the close of the grammar-school work, should not our pupils not only understand in a general way the significance of the arts of industry to human life and occupation, but—for this is of more importance—should they not have come in contact with and have gained some insight into those fields of knowledge and thought which have been opened up to man by the evolution of these arts? And further, should they not have realized, by the apperceptive power of self-experience, the nature of the motives and effort with which these arts were touched in their realization? Whether the intent of the pupil is to go at once into the world of work or to the high school and then to the college—in either case would not the intelligence of the move be furthered by such insight?



TURBINE JET WATER-WHEEL WITH COUNTERSHAFT. A STUDY IN HYDRAULICS.

In a rough way we may say that the function of the school, or education, is to give our youth their bearings in the world, and power to

maintain these bearings properly. Geography is concerned with these bearings as regards place on and relation to the physical world; history, as regards the institutional development and civilization of the race; literature, as regards the recorded thoughts and aspirations of man. What in the school is to give a boy his bearings as regards all these forces, economic and intellectual, which are associated with the practical arts of life, and with which he and his fellows will be most occupied? In fact, this is the bearing of primary concern, without which those others avail naught, and with which only can the others be effectively realized in life.



A PROBLEM IN MECHANICS, WORKING WHICH ONE BOY FOUND HIS BEARINGS AFTER YEARS OF MAKING THINGS.

In connection with this point not inapt is a statement of Huxley's that

> We may go on developing the intellectual side of life as far as we like, and we may confer all the skill that teaching and instruction can give; but if there is not underneath all that outside form and superficial polish the firm fiber of healthy manhood and desire, our labor is absolutely in vain.

Now, healthy manhood and desire cannot be secured by the development of an ultra-intellectual life apart from practical world arts.[1] All school and home matters contribute toward these, but no one in particular, unless it be manual training, is effective in this to the extent that it deals with the forces involved in the same vital way of experience by which they have been incorporated into the brain and tissue of human faculty.

But, as has already been indicated, the brain-and-tissue side of manual training has been given most of the attention thus far, and it is the "forces"—the informational or thought side—which it is desired to bring to the front. There is much at present which indicates a desire for this. Many interesting efforts are being made to connect the manual work with some special information. Many of these efforts have resulted in superimposed information, or work, of little real life and bearing upon vital matters, or else they have

[1] HOBSON, *The Social Problem*, pp. 125–7. Interesting relative matter.

required such concessions as to impair its value seriously as manual work. The information and the work should be mutually supporting and stimulating, giving a feeling of consistency and of vital interdependence, that the activities may be rich in thought and the thought rich in action. And further, the thought and action should be concerned with matters of some significance in the arts of industry, that insight may be given into the spirit of their creation and creators, thus adding breadth and sanity to the pupil's conception of the activities of life. This, perhaps, would be our first connection with our "gospel of work."

But nothing, I venture, is more important at this age, so sensitive to the interests and motives of the adult world, than that our pupil be constantly occupied with the inherent worth of things, that he may acquire an undoubted faith in his own kinship with such worth, and so be inclined to seek content in no more selfish relations. Mr. C. S. Peirce, in a critical review of Pearson's *Grammar of Science*,[1] touches this point very significantly in considering the question of "motives that move the man of science." He says:

> Social ends do not animate the labors of the scientific man . . . . He has received a deep impression of the majesty of truth, and found his own mind sufficiently akin to that truth to enable him, on conditions of effort, to interpret it in some measure.

With no better business can the school be concerned than that which is here suggested — to give such deep impressions of the beauty and majesty of truth that with it a kinship will be established sufficient to cope with the strains and temptations of modern life. That peculiarly satisfying feeling experienced at the solution of the geometrical problem, when the law and harmony of relations is perceived, is of this type of impression. More such perceptions are wanted, and especially valuable will these be if perceived in the real everyday world, rather than abstractly. A pulley belted to another is a better study of a circle than a line drawn on paper.

It is a commonplace to hear that music and art require special education and culture to be truly appreciated — that is, special insight and understanding. But this is true of all human interests, hence the study of economics is increasing in college work. As often and as justly could that which is so commonly said of art and music be said of architecture and engineering works by those who see no harmony and meaning in the disposition of material and parts in a Brooklyn or

[1] *Popular Science Monthly*, January, 1901.

Washington Bridge, and no beauty in the harmonious motions of a great steam engine or printing press. Where has the imagination of man created more admirably? What has it touched with greater social effect?

II.

It is suggested, then, that some "insight" into constructive and engineering matters is necessary if any culture value is to be realized through ability to appreciate the creations of man's imagination as expressed in the material and engineering arts. If there is any social

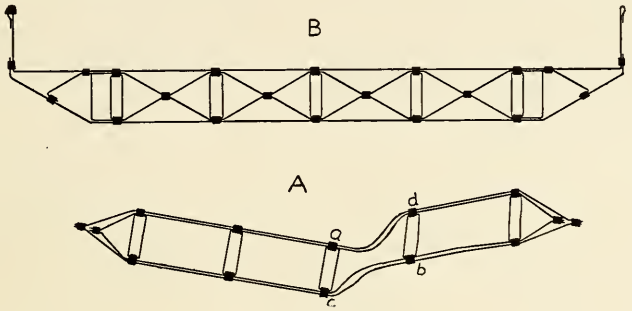


FIG. 1. GIRDERS.

importance to this, it is important school business, and if school business, it is the special work of the manual training.

Now the matter of "disposition of material and parts in structures" touches the heart of our boy engineer's troubles, and without some insight into this matter his power and outlook in this direction will be limited and give no large encouragement to effort. The consideration of constructive ideas of somewhat universal as well as immediate application should be early business in the shops for the age under consideration. At this time, if at any time, fine corners and edges for the sake of fineness are hardly worth the struggle, in the boy's mind. Such matters are from the cabinetmaker's point of view and according to his standard, and it is difficult to see why the cabinetmaker should dominate so much of the school shop's practice. If the earlier age mentioned is one of fancy, here the first steps require that this fancy be associated with real live works of the world, and that means be supplied and opportunity given for experience with such things and for the expression of thought derived therefrom. Success in this would be successful manual work indeed.

The practical suggestions that follow are intended only to indicate

one way in which some good work may be realized in line with the thought of this paper and in accord with the statement immediately above. The object of construction is to arrange the material of construction in the best manner to do the work required. This idea may be presented very satisfactorily to a class by experiment. In Fig. 1, *A* and *B* represent two girders. Both contain the same amount of material — four pieces crosswise and five upright struts. *A* was tested by being placed upon two uprights with weight suspended from a point in the center, the weights being put on one by one by some boy until

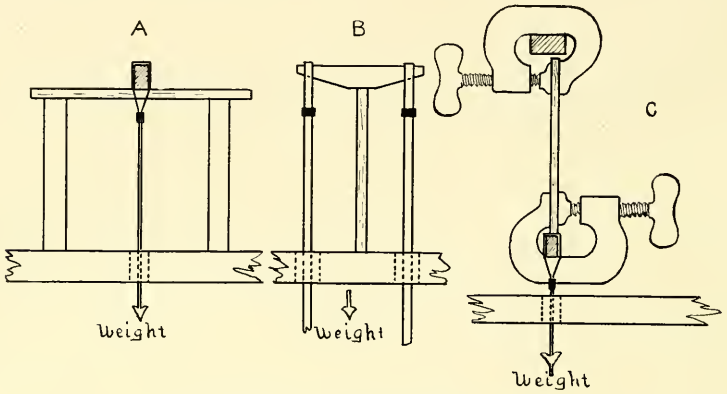


FIG. 2. STRENGTH TESTS.
A, Transverse Strain; *B*, Compression; *C*, Tension.

it gave way as shown. *B* was tested in like manner, another boy putting on weights until several more than were required to break *A* were added. Here a dislike to break *B* showed itself in the class, and the evidence showing that *B* was much stronger than *A* was accepted as satisfactory. Why was not asked, so ready were explanations, and it was soon clear that the difference was in the arrangement, not in the amount of material. Thus a lasting interest in the arrangement of material was secured and considerable information obtained concerning its importance. In girder *A* it was noted that the corners *a* and *b* had approached each other in breaking, while *c* and *d* had separated. In *B* it was seen that the diagonal braces from corner to corner would prevent this change in the relative position of the corners, and so aid the structure to maintain itself intact. Immediately these parts meant something more than a pleasing arrangement, and to work them into the position of greatest strength became no arbitrary task, but that which was to put soul into the structure. This well illustrates simple

work concerned with a principle which has inherent worth and appeal, and gives some insight into the kind of thought put into engineering and constructive works.

A few simple experiments will show that the strain any material of a given size will stand before breaking depends upon the manner in which the strain is applied, whether transversely, by compression, or by tension (see Fig. 2). And the bearing of this upon the arrangement of material in construction can be clearly brought out by experiments showing the typical methods of arrangement used in construction work, which aim to adjust the material so that the strains within it will be either those of tension or compression (see Figs. 3 and 4). This, in turn, throws more light on the problems in the girder, and it may now be seen that in *B*, Fig. 2, part of the material was arranged in a place of greater efficiency, because thus arranged the strains became more directly those of compression and tension.

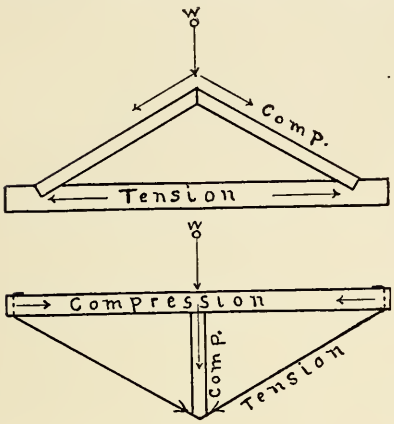


Fig. 3.

Fig. 4 illustrates the idea of bracing. The principle involved in bracing is at the basis of all construction, whether it be a chair or a bridge, for somewhere within there must be a bracing element. Many models have been made in our manual work involving and embodying the brace idea, but it is a question if sufficiently often the maker has been as keenly conscious of the fact as is desirable, so commonly is the brace element so obscurely embodied in the structure as to require no treatment as a brace. In working out constructive ideas in iron-work

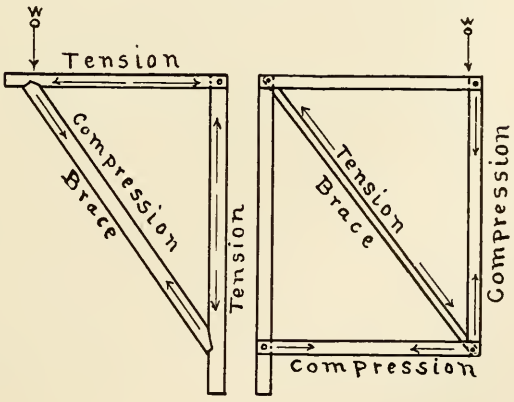


Fig. 4.

many of these objections are not met with, for the larger members of the structure are made up of smaller parts, each requiring special handling and consideration, its proper constructive name given and its functions dealt with. Each part will stand for a specific work —a line of force. In this work a brace is dealt with as a brace to co-operate functionally with other parts, and the problems are separated in such a manner that they can be readily presented and grasped. Such information and thought as are here suggested could hardly be charged with being superimposed or arbitrary, nor need the work as manual training concede any vitality because of its presence.

Now these ideas of construction should be related to and given their place in works of some moment in the world. In this direction nothing, perhaps, will give more satisfaction than a short general study of bridges, not failing to notice other like structures, such as steel roofs and building frames. Nothing in the engineering world more graphically represents constructive ideas than bridges of various types. The economy of bridge construction demands such an arrangement of the material that, when fixed, it stands for the lines of force, insight into which is necessary for appreciation.

Aside from the beauty and grandeur often expressed in bridge construction, bridges play and ever have played a large part as social, political, and industrial factors in the world's history. In the interests of intellectual unity and balance toward human and world activities, should not our pupils' conception of the bridge as a work of man be commensurate with their conception of the bridge as a social, industrial, or geographical factor? Here is a type of correlation of which we could stand more, and which is a very different matter from the simple association of incidentally suggested things.

The experiments on strains and arrangement of material give insight into and lead directly to the fact that bridges and other structures are named in accord with the principle of construction involved in the arrangement of their main parts, giving the cantilever, suspension, truss, girder, arch, and bowstring types. The experiments on braces, tension rods, etc., give meaning to the smaller members of the structures.

The use of pictures in this work is of immense value, for noted bridges and other structures may be presented, combinations and variations of types discussed, and opportunity to ask good questions offered.

It should be borne in mind that technical or mathematical knowledge is not the point in the work, it being neither possible nor desirable; the real thing desired is insight into the forces at work within these structures that they may be utilized with reason and purpose.

Thus far the constructive thought has related to matters of the larger (out-of-home) world of work and interest, which matters as a rule give best results handled as class projects. But the same thought should be utilized in immediate and individual projects also, for, as already indicated, our young constructor's trouble comes not so much from a lack of ideas as to what to do as from a lack of ideas as to how to do—how to get at a matter, how to proceed so that the results will encourage him. The purpose, then, of our definite constructive insight should be not only to bring the mind of youth in contact with the mind of man as revealed in his works, but to give movement and direction to action on a basis of reason as to cause and effect, leading to powers of vigorous thought and action.

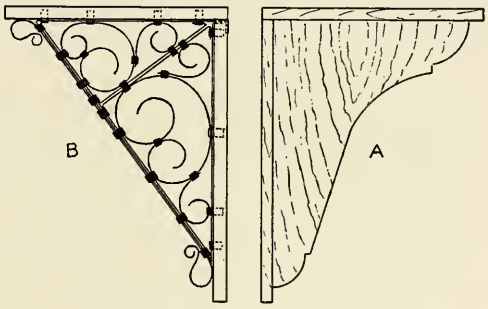


FIG. 5.

Directly related to, and dependent upon, construction is beauty, one phase of which would be ornament of structure. We have considered the separation of constructive thought into simple concrete problems which can be grasped readily; the same method is as desirable in presenting elementary decorative thought. This is illustrated in Fig. 5. *A* is a bracket made of wood; *B*, one made of iron. Now the point is not that the iron bracket is the better bracket, but that it is a better presentation of the constructive and decorative problems involved. Each part may be dealt with separately as a simple problem within the pupil's grasp. The lines of structure represent clearly the forces involved, while the graceful curves of the ornament suggest ease and repose. *B*, then, is more apt to encourage a feeling for the forces within the structure, and for the harmony or fitness of the material to resist these forces, than *A*, where the brace or structure element and ornament are so involved as to some extent to weaken and obscure each other. Figs. 6 and 7 show designs made by pupils.

This matter of adapting the form of the structure to the forces involved is still further illustrated in the mechanical shovel, Fig. 8. When constructing the model one boy inquired why the holes were bored in the mast and boom. The discussion which followed brought out the fact that the strain in such structures is in the outer edges,

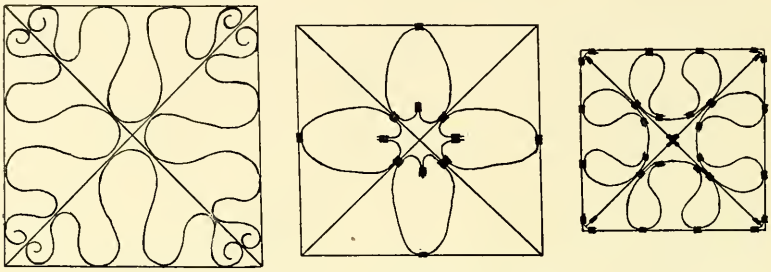


FIG. 6. DESIGNS FOR TABLE MAT. TRACED FROM ORIGINAL SKETCHES.

and that the material within is employed entirely with keeping these edges in position. This made the form of these holes seem quite satisfactory. It was seen that they gave relief and emphasis in accord with the forces at work in the structure. It is a question if, in the shop, we can do anything which will contribute more toward real art appreciation than deal with the form and fitness of material in harmony with the forces involved, which is at the bottom but the problem of space values. It surely has some advantages over the very vague

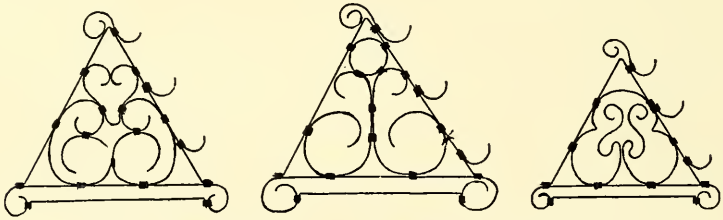


FIG. 7. DESIGNS FOR PEN RACK. TRACED FROM ORIGINAL SKETCHES.

problem of "making a thing beautiful." In fact, the matters concerned are so fundamental that we cannot be excused for neglecting them.

But there is much more than giving insight into these forces involved in construction which is important manual-training business. We may find what this is by inquiry as to what fields of thought and knowledge, or what arts and sciences, have been involved with the arts

of industry and the handwork of man. Important among these are mechanics and the mechanic arts (distinguished arbitrarily from construction), physics and the related arts and appliances, and mathematics. As to treatment, little need be added to what has already been suggested, the important point being that these matters be treated, not as abstract sciences, with fine apparatus and special textbooks, but each given its place as a part of the working world, and as

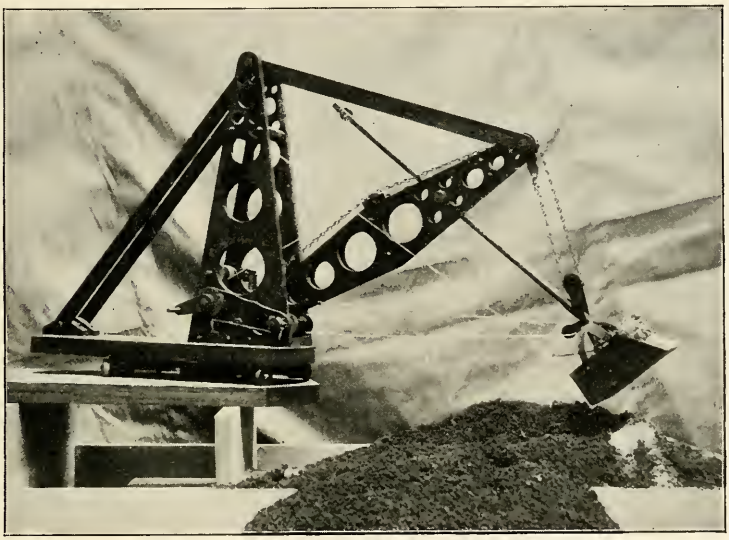


FIG. 8. MECHANICAL SHOVEL. A STUDY IN WHICH THE MECHANICAL PREDOMINATES.

part and parcel with the manual training necessary to intelligent action. Should we not, during the period of life here considered, be concerned more with building up a world of law, purpose, and beauty, which on all sides will give joy and inspiration, rather than be concerned with analysis and abstractions better fitting the age and temperament of the sage ?

In the organization of the manual training as a department of information and study an important feature would be a museum of the arts and industries. The value of such a museum in connection with geography and history is already well understood. To those who have any finely worked out courses which stand to them for brain and tissue probably it would have little value. On the other hand, to those who

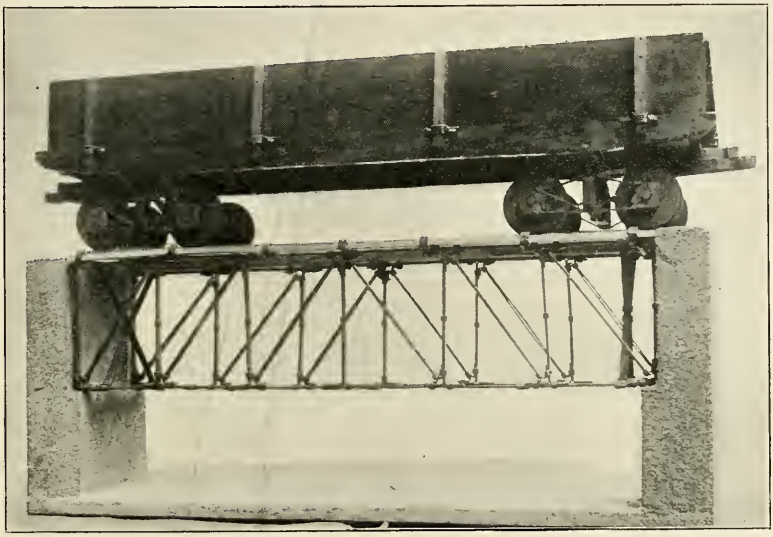
recognize the shop as a place for study and investigation — a place where information is gained and utilized — the museum would be of great value and, I suspect, would be the course in manual training *par excellence*. This course has been worked out by man in all ages; it represents his knowledge and insight into all matters related to hand-work. Stage by stage in its development it is represented, from that which barely aided the hand to that which is automatic. Here is a course from a master-hand. How to use it is the question. It does not represent a gradation and sequence of tool exercises perfect enough for some, but for those who desire to encourage the study of industrial art processes, or the application of some law of mechanics or physics in industrial work, such a museum would be a mine indeed. With this material to furnish the imagination there would be reason to expect from the pupil some real creative or inventive thought. For in re-creating there should be free play for any personal motives, that the work may become an affair of the pupil's own. This puts the thing to be made in the form of a problem or study, which can be worked out with some individuality. *It puts the pupil in a position to tell what he wants and needs, rather than in a position to wonder what is wanted of him*, for he has planned the project according to his understanding of the working principle, and the causes and effects involved, and this plan represents his way of attaining the result desired. Who, then, but he can lead the thought? The most gratifying work ever done by the writer was of this kind. The purpose of the project, the function of its parts. and the principle upon which it worked were discussed, leaving the pupil to bring in a plan for the same and work it out as his own business.

From the manual-training point of view, a museum with a few models that have large relations and which can be used with a definite purpose would be more serviceable than one having many models with little definite bearing upon the purpose of the work.

Another factor in the organization of the manual-training department as a department of investigation which is worth consideration is the shop library. The purpose of this library should be to encourage and facilitate investigation and inquiry into the arts and sciences and related matters, and in character it would be a library of arts and industries. Not only would it be of value in giving the immediate work its proper field of thought, but it would be of great value in co-ordinating and unifying the interests and purposes of the whole school. An illustration of this may be worth while. In our shop

library, under the head of civil engineering, there is an article on "How Holland Was Made" (illustrated). In the shop this is of engineering and mechanical interest; in the school work it has already been utilized as of geographical interest. This well typifies the relation of the manual-training department to the school.

The material of such a library might be in three divisions: reading matter, pictures, and drawings. In their selection three aspects of

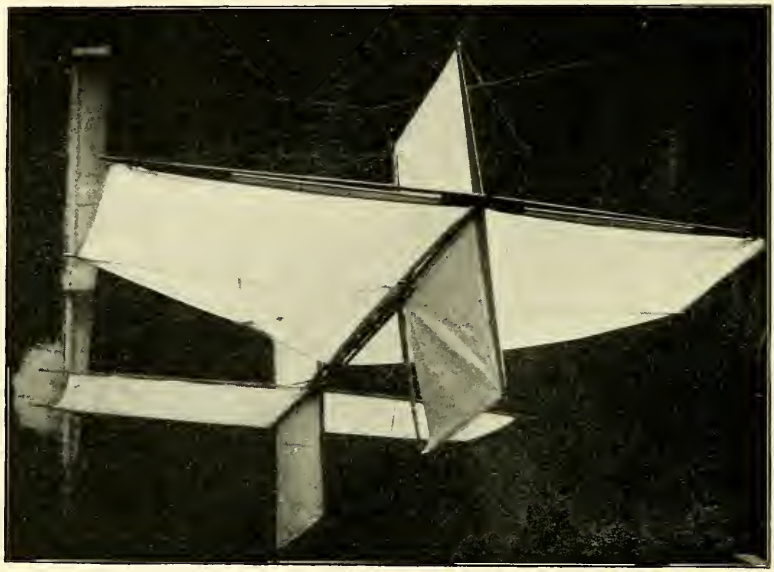


SIMPLE TRUSSED GIRDER BRIDGE AND CAR WITH TENSION TRUSS TRUCKS.

the subject might be considered: the historical and evolutionary, the constructive and engineering, and the general — meaning related matters. In such a library it is the short article, not the treatise, which is most useful; for when a boy is interested in any subject, an article put into his hands that he can read in an evening is what is wanted. It is the characteristic and peculiar aspects of such a library, rather than its details as to division of material, which is of concern here, and perhaps the most peculiar thing about it is the source of the material. The writer has found little in the libraries of New York which could be used directly, the chief reason being, as already indicated, that books for the most part are not desirable. Current literature will supply a great deal of just such material as is wanted, if one will but cover the field well, and include scientific, technical, trade, and sectional magazines.

From these sources real treasures for such a library will be found, not only in articles, but in pictures and drawings, and under the three divisions mentioned, the historic, the engineering, and the general.

Organized on the thought and motive side, with two such forces as a museum of live working material and a library of ready information to inspire creative impulse and the imagination, and as conserving factors keeping the thought and work in touch with matters of real



AIR-SHIP. AN EXCELLENT PROBLEM IN CONSTRUCTION, CONCERNED WITH DISPOSITION OF MATERIAL AND BRACING.

human concern, the manual work in our schools would acquire additional respect and attention as a vital and integrating factor in education.

To summarize, the following would be given as containing the important points brought forward in this paper:

1. To develop faculty and power and give opportunity for "self-expression" is but half of the manual-training problem, so important and pressing are the questions: With what shall the expression be concerned? and, In connection with what interests and purposes shall faculty and power be developed?

2. The arts of industry involve practically all the motives and associations that have inspired the handwork of man; and as they were

evolved integrally with all else of human concern, so would the manual work, as representing the arts of industry in the school, integrate naturally with the other work there. The problem of correlation then becomes more a matter of growth and self-realization from within, on the part of manual training at least, than an exploitation of the curriculum for associations that when found are but incidental, and, because they are concrete, are misleading and often overvalued.

3. Kinship with the world's work and workers is the social function of manual training considered on its thought side; and to this end should the pupils be constantly occupied with the inherent worth of things that they may acquire the spirit of the best work and achievement.

4. The thought and motive side of manual training is of particular concern to that age in which contact with realities and world affairs is craved, and in which are formed the first images and standards of adult life and purpose.

5. The organization of manual work for information and investigation is quite as important as its organization for motor training, if it is to contribute anything of great ethical and social value in life.

WALTHAM, MASS., June, 1901.

SPIRIT AND PURPOSE OF MANUAL TRAINING IN THE ELEMENTARY SCHOOL.

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ONE'S manual-training creed must be, to all intents, his educational creed. So far as concerns the elementary school at least, the segregation of studies is fast falling into a merited disrepute. The tendency is toward unification.

While elementary manual training has always regarded itself as the particular godchild of psychology, its typical teaching appears to be not in close accord with psychologic theory. There are, indeed, two very distinct tendencies obtaining, one of which claims for itself a psychologic basis, while the other bears conspicuously the sign of manual craft. It is convenient to regard these under separate captions, the first concerning some applications of the culture-epoch theory. A third aspect, which cannot receive consideration within the limits of this writing, has to do with the art viewpoint.

CULTURE EPOCHS AND CONSTRUCTION.

Following upon the revelations of embryology, the neurologist has carried the ascent of man well into the postnatal period. It is now possible to make several propositions of a general nature concerning the first five or six years of the school period. In their bearing upon the manual-training problem these seem safe so far as they deal with the physiological. It is not probable, for instance, that anyone today would care to arise in defense of any kindergarten exercise which requires an eye-and-finger co-ordination of either complexity or definiteness. And this immunity of the kindergarten child from unseasonable requirements is coming to be shared by pupils one, two, or even three years his senior. In the primary period those motor exercises which are distinctively manual training are yielding more and more to others which are characteristically trunk and limb training.

Beyond this comparatively safe physiological field the culture-epoch theory takes up the thread, propounding a sequence of more or less definite culture periods, whence its name. Exactly as the embryo exhibits a biologically correct sequence of fish-like, reptile-like, and mammal-like suggestions, so the child somewhere in the middle

reaches of his first decade is reported to act out a period of nomadic tendency preceded by an even closer approach to savagery and followed somewhere by a myth-making age.

While this postnatal succession seems only a plausible consequence upon the established facts of embryology, it has not as yet been substantiated by similarly tangible data. It is one thing to ask a microscope a question a thousand times over. It is quite another to ask a thousand children a verbal question as to their likes and dislikes. And the resultant curve can in no case, probably, be accorded the unquestioned status enjoyed by the other sort of evidence. And there is the possible objection that, whereas the prenatal successions are the expression of scarcely calculable epochs of evolution, the culture stages have no such immemorial foundation upon which to conceive a definitely manifested survival of tendencies.

The obtaining pedagogic applications of this theory appear even more questionable than the theory itself. We need only examine the flood of recent supplementary reading to note how profoundly this epoch idea has affected modern teaching. As a rule, the Eskimo and the Indian fight for chronological first place. More or less dessicated treatments of Robinson Crusoe follow, while the Ægean myths seem accorded the mercurial privilege of dropping in anywhere, sometimes paving the way for the lore of the nomads and at others approaching within a hand-shaking range of the boyhood of Columbus. It is here to be asked whether the seven-year-old's genuine, spontaneous delight arises in an inventorial and detailed contemplation of the moccasins, tent, and canoe of Hiawatha or in the idyllic, untrammeled life, and most of all in the seductive rhythm of Longfellow's meter.

But it is in the field of constructive expression that astronomy descends to astrology in the applications of the culture-epoch theory. In casting about for a savage environment in which to isolate the twentieth-century child of civilization, the thing may be carried to an excess of thoroughness. It is proposed, inasmuch as the boy loves the tale of Hiawatha, that visions of the wigwam, the bow and arrow and the canoe, will dominate his constructive mania. And similarly that the igloo and kyack of the Eskimo will be his chosen field of expression upon presentation of that type in his stories.

There is a probability, however, that a generally nomadic tendency may exist wholly independently of an attraction toward the merely factitious aspects of any isolated instance of nomadic life. In other words, an eight-year-old child may career wildly within a five-acre lot,

obeying the mad instinct of the wild man within him, without once exhibiting preference for a tomahawk over a hammerless revolver.

In the hope of gaining light upon this relation of culture epochs to constructive expression, I have lately been able to make an extended study of purely spontaneous construction by children. At stated hours daily the shop was thrown open to all comers. All restrictions were withdrawn from their operations save the tacit agreement that the tools belonged to the house. The lower primary children (from five to seven years of age) were conspicuous by their numbers, enthusiasm, and unremitting attendance day after day, and their fertility of project. Most of these children had been given Indian stories. They had seen wigwams realistically produced upon the sand table, with real poles giving form to the burlap cover. In one room a full-sized tepee had been erected, with its burlap cover decorated by the student teachers with Indian devices. It remained for several months a monument to their painstaking industry. Moccasins, mortars, bows and arrows, canoe models, and other appurtenances of Hiawatha's domestic economy had been laboriously gathered and brought into candidacy for the children's interest. Provided this interest arose in other than the specious sort which so often deludes an enthusiastic and beloved teacher, it should have manifested itself in the *spontaneous* activities of the children. Such manifestation was conspicuously and wholly absent. No child wanted to make canoes or tents or moccasins. After the first novelty of apparition no child wanted to play about the tepee that was set up. They wanted to play tag and kindred games. And if by concerted intent they had ignored the tepee, its entire oblivion thereafter could not have been more absolute. On one afternoon only, and in response to a teacher's instigation and close supervision, a small group of eight-year-olds made bows and arrows. But their favorite projects were household furniture and ships of battle. The children of the first three grades especially were tireless in their reproductions of the "Iowa." A fragment of board was roughly hacked into a water-line plan. Upon this was nailed a rectangular piece vaguely standing for the upper works. Upon this again were imposed sundry chunks of wood variously representing turrets, smokestacks, or pilot houses, according to the maker's hazy conception. The whole superstructure usually bristled with horizontally projecting nails. These, the architects informed me, were cannon. It required some diplomacy on my part to prevent this wholesale installation of ordnance from entirely depleting that portion of my manual-training supplies.

Imitation was the law of action, irrespective of age. One day a boy conceived the idea of a sled, to be drawn down the steep wooden sidewalks of his part of town. For the ensuing several weeks every boy from six up to the school limit, unmindful of his specific culture epoch, had one deep-lodged purpose in life, namely, the making of a sled for these snowless slides. At another time a mere baby seized a sliver of board, nailed a cross-piece near its blunt end, and lo! it was a sword. This creation took like the whooping cough, both up and down the line of years. Boyville for two weeks or more thereafter was a unit upon the necessity of a standing army of swordsmen. Some of the upper-grade boys devised specially patterned hilts and more or less deftly tapered blades. But the initial fact remained. It was not the spear or javelin of yesterday. It was the sword of today.

Another striking aspect of this free-for-all tool play was the disparity of ambition exhibited. The smaller the boy, the greater his project. The favorite enterprises of first- and second-grade children were chairs and tables. The construction was simple and expeditious. A slab of untrimmed kindling afforded the seat. Another slab, split into four sticks, gave the legs. A nail apiece fastened these under the respective corners. Occasionally a back was added by an equally simple type of joinery. One little chap from the second grade showed me his "table," with the joyful boast that he had "had four kids sittin' on it an' it didn't break." He further designated the corners whereon the respective "kids" had rested. His satisfaction was replete when I myself sat upon his table without disaster.

One boy, of the third grade (eight years of age), built a "chutes." Despite its absurd structural weakness, it bore a striking resemblance to the real chutes in a neighboring pleasure garden. This model exhibited a considerable fidelity to mere visual fact, but little to organic dependence where distribution of strength was concerned. This same little fellow, Eddie, was busy the other afternoon in hacking out a crooked shape, which he informed me was a pistol. Later in the afternoon he entered in grave consultation with me as to the possibilities of making a pencil holder. This he accomplished that same day by boring a hole grainwise of the wood and whittling away the superfluous material until only a shell remained. I could see that this pencil holder was suggested in his mind by the pistol barrel.

Were it requisite, other instances in abundance could be cited of spontaneous construction in which, with no exception, the child chooses his motif from his own times and his own environment, even

after others have been brought into impingement by his culture studies. My own deduction is that the manual training reaching most effectively into the white child's life will not employ the devices of the red adult. It is true that these same devices would appeal to the papoose in the forest, not, however, because of a racial instinct, but owing to a specifically suggestive environment. On the other hand, the evidence of the white child under spontaneous activity (and no other evidence is wholly trustworthy) seems clearly to supplant the canoe by the trolley, the spear by the sword, the pirogue by the armored cruiser, and the bow-arrow by the revolver. I am not here outlining a model series, a thought in itself incompatible with the pedagogy we have been examining. I am simply regarding racial instincts in the dual light of the applied epoch theory, on the one hand, and the child's untrammeled predilections, on the other.

In the present connection Dr. Stanley Hall's *Story of a Sand Pile* is to be regarded as a classic. And there is nothing in it which does not confirm the belief expressed above. Another contribution, which unfortunately has not been as generally read as its importance warrants, is Mr. Jackman's article in the *Educational Review*.[1] The recent experiments in textile work by Colonel Parker, Dr. Dewey, and others seems a hopeful indication that the mis-application of the racial-instinct theory is about to terminate.

THE MODEL-SERIES CUSTOM.

It is a fascinating thing to make out a course of study; to cast up our little store of knowledge, theory, and device; to eliminate and rearrange and modify; and finally to evolve the coach and six that will carry childhood on the road it should go.

The feasibility of such a solution of the problem of education is a matter of individual belief. At all events, its usefulness is probably confined to the subjects of study as distinguished from the modes of studying subjects.

This distinction between subject and mode is an all-important one. The modern movement in teaching has shaken

Subjects of Study.	Modes of Studying Subjects.
Arithmetic	None
Writing	
History	
Drawing	
Spelling	
Geography	
Etc.	
Etc.	

[1] PROFESSOR WILBUR S. JACKMAN, "Constructive Work in the Common Schools," *Educational Review*, February, 1899.

off mediævalism by one sharply defined step. The single category, in which every aspect of study was a subject, has been abandoned. A dual category has been substituted wherein there are, broadly, only two subjects of study, while all else are modes of studying subjects.

Subjects of Study.	Modes of Studying Subjects.
Science	Making
History	Representation
	Language

In the light of this classification manual training cannot be other than a mode. To place it among the subjects would seem a fundamental mistake. Despite sporadic "systems" in everything from penmanship to rhetoric, it is clear that no *mode* of study can be fore-ordered in a "course" or "series." Such a procedure constitutes it at once a subject instead of a mode, in which capacity it has no place in the elementary school.

It needs but a glance to identify such manual training with the obsolete methods of teaching language. In the days of the old primer reading was taught upon the model-series idea. "The cat is on the mat," "The cat can catch the rat," etc., were models in the series. Today that stultifying method seems remote indeed, so far as language teaching is concerned. But in manual training the model-series idea is yet dominant. There is the feint at elasticity whereby the models are supposedly adjusted to local needs by substitution, say, of a stool for a bootjack. But the real issue remains untouched. To awaken in the pupil his highest creative ardor, or at least to subserve it, his construction motive must arise in that individual environment pertaining to his school alone and to him alone. If one could put his finger upon the best school in our land, these things would appear regarding it:

It could not use any text-book — published or to be published — *as* a text-book. It could not use any other school's course of study *as* a course of study. It could not use any series of models, not even of its own devising. Wherever, in an elementary school, you find its manual training compassed in a series of models, the pedagogic cuisine of that school is being run on a picnic basis of canned goods. It is a kind of light school-keeping that does not get down to the springs of life.

If the modes have their *raison d'être* in the subjects, then the exercises in making, representation, and language generate spontaneously out of the exigencies of science and history study. You

say the boy is interested in his sloyd. That is in part a commendation of the sloyd. But it is in a greater measure an arraignment of the school regimen he has endured previous to its induction.

The real criterion is the healthy child's incentive to activity. In the sloyd idea we supposed we had found for him the highest incentive. Hitherto grievously oppressed by the wholesale inhibitions of the class-room, he seized with avidity the concessions offered by the sloyd work. It was a great step toward freedom, nevertheless leaving much to be accomplished. In a model series the worker's activities are constrained toward the realization of another's conceptions. According to Dewey, this is Plato's idea of slavery.

Where the school life takes a vital hold upon its pupil, engendering lines of interest that outlive the lesson period, he begins to have projects — dawning visions of contrivances which are not sloyd models and are not preconceived nor inconsequent upon his ardors. His inventive genius, quickened to a fervor by good teaching upstairs, supersedes the model by something immediately relevant to his line of interest. He will thereafter pursue the model series, if you desire, but he has in mind something he would rather do.

I find myself encouraging these defections about as often as they are manifested. From time to time there is a voluntary return to the model series, apparently in those periods when genius chooses to lie fallow. At such times the pupil shows the fine appreciation characterizing the sloyd worker, and is at exceeding pains to attain the sloyd standard of workmanship. These occasional recourses to the disciplinary side of handicraft have a favorable reaction upon his skill in correlated projects.

The model-series plan is well adapted to city systems, where, apparently, the mediæval classification cannot be effectively superseded. All studies remain subjects, as of old. There are no modes. Hence the current outcry concerning "overcrowded" curricula. Every change in treatment, purposing at once an enrichment and an economy of study, is translated by the city school machine into an extra "subject."

So far as my own work has concerned manual training, it has been my practice for years to give the first place to correlated projects and the second to sloyd exercises. At present our pupils are troubled but little by sequence of exercise. Their workmanship is held under a certain surveillance, but the requirement is elastic and does not ordinarily come to the surface. Some of the older boys are making tailless kites and find themselves mightily confronted by problems of

proportion and balance. Elsewhere both sexes are making boards for their relief maps. A while ago the children were studying frogs, whereupon developed an epidemic of fish-net making. When the subject was winds, weather vanes and kites were above par. The study of germination created a universal demand for planting boxes and plant labels. The normal students have lately been busy upon ant-nests, caterpillar cages, and aquaria. It is needless to confess that the sloyd standard of workmanship has not been maintained in such exercises.

There has meantime been a quiet but steady demand for *husslöjd* ware — bookshelves, stationery boxes, stands, etc. — a sort of disheveled sloyd. The loss of certain disciplinary values has been compensated for by the incomparable ardor of the worker.

Still another line of work, quiet but steady, has been the sloyd itself. It is to be noticed that the most faithful adherents of the model series are not among the most energetic and self-sustaining pupils. They seem to belong rather to the habitually receptive class.

The term "self-affirmation" is abroad. Guarded against abuse it is a highly useful one. Tempered with an immanent social consciousness, self-affirmation is true freedom. Not so modified it is license. The ideal in manual training is to afford the pupil a free field for self-affirmation, advised by a growing consciousness of social impingements. So long as his constructive activity makes for legitimate ends, it should feel as lightly as possible the rigid harness of models for series' sake. The educational fabric must melt and enfold the pupil in his own image. His constructive problems must arise out of his daily life.

In the ardor, the versatility, the virility of purpose thus engendered, the values claimed for model series are transcended. Mr. Daniels' article on "Library Handicraft" in the January number of this MAGAZINE has more potential vitality in it than all the model exhibits since the centennial have had. His little garden might, or might not, thrive if transplanted. But what he offers us is a vital spark, without corporeal proportions, yet having fire enough to burn away the dead wood of our "systems," if we will but accept the torch. Elementary manual training must cast away its fetich. "Thoroughness" is a relative term and is not otherwise applicable to life.

CREATIVE MANUAL TRAINING.

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EDUCATORS are generally agreed that one of the prime objects of education is to fit the pupil for independent individual action. As Professor Wiliston has said, the demand today is for men of originality and energy who can do things that have never been done before; who can bridge over the gulf that has so long existed between thinking and doing. Herein lies the great strength of manual training, as it combines the thought and the action, resulting in a real object which, with greater or less success, embodies and presents to all who see it the ideas of the man who made it.

This object must of necessity be a representation, more or less perfect, of the mental image that existed in the mind of its creator. The progress of such an image from its initial vagueness to clearness and definiteness is dependent upon the mode of its final expression. The least perfect method is by the written or spoken word, for all mere descriptions must be more or less vague. One common expression, "a word-picture," used in connection with any unusually good piece of writing or speaking, is a recognition of this truth. Next in order of completeness comes a drawing or a series of drawings representing the object; and lastly the actual object constructed from the necessary materials and giving the hitherto unreal an actual existence.

Froebel, the founder of our kindergarten system, thus expresses this psychological fact: "The educator must make the external internal and the internal external." That is, he must so elucidate and make clear the essential facts of the subject in hand that they enter into and become part of the very being of the pupil. This, however, is but half the task of the true educator, for he must then by some means or other enable the pupil to make this internal external; that is, he must give the pupil the power to again give out what he has taken in, and enriched with his own personality. The individual must have ideas to express, but, having them, they are worthless unless he can make them useful to, and understood by, others.

I wish to call attention to the order here stated; the reception, or

taking in, *must come first.* To do creative work of any character, the individual must have in his mind the content, the necessary conceptions which are involved in the thing he wishes to do. A consideration of this principle will, I think, explain the failure of many of our attempts to secure self-expression from our pupils. They have taken in so little from their instruction and from the world around them that, were they possessed of the most perfect system of expression, the results would be of no importance. They may have a hazy idea that they want to accomplish a certain result, but they have no conception of the details that are necessary to the desired construction; or, having them, they do not know how to combine them properly.

We ask a twelve- or thirteen-year-old boy who has mastered neither his tools nor the principles of construction to *invent* something. We might as well order him to be six feet high; for what is invention? Invention is the power to modify and recombine our images and ideas. The true artist sees elements of beauty in many landscapes, and by combining them he paints an ideal landscape that is more beautiful than any that he has seen. The inventor pictures a balloon impelled by electricity and guided by the hand of man. He endeavors to adjust the forces and use the materials with which he is familiar to accomplish his end.

We may now make a deduction as to the necessary elements in creative work: first, the necessity for the invention, or the desire for the new creation, must exist in the mind of the pupil; secondly, he must have the knowledge and skill necessary to realize his conception. No scheme of instruction will or can be educational — that is, of value in developing definite concepts and giving power of expression—that does not make him familiar with the principles, tools, and materials that he is to use.

It is the misfortune of manual training that it is often directed by people who know nothing of the principles of construction, and therefore cannot impart them to their pupils. I have seen a man who did not know how to make a box trying to teach a pupil how to make a telephone, and a woman who could not make a sandpaper block endeavoring to teach the construction of hexagonal tabourettes. I once visited a shop where a pupil was constructing a chair under the supervision of the teacher. The legs were made of pieces 1½ inches square, and the seat was made of a piece of pine ⅜ of an inch thick, without rails or braces of any kind. The inevitable result was that the seat

broke through the middle as soon as the builder sat upon it, and he flung his creation aside in disgust.

Again, I visited an exhibition of constructive work where I saw a model, so called, of a spinning wheel. This was so constructed that the connecting rod struck the frame, and the wheel would not revolve. Such an object as this is absolutely worthless. Except for a little manual dexterity in shaping the different parts, it taught nothing. More than this, the basic principle of the machine was not present, and the chief good of such constructions, the combination of parts to produce a certain result, was lost to the pupil. Even supposing that this object had been perfectly constructed, it would not have been as good educationally as some object of simpler construction more intimately connected with the pupil's daily life or experience. A knowledge of spinning wheels is not essential in the twentieth century, and certainly it is not knowledge to gain which the pupil and teacher should spend valuable time.

Manual training does not aim to prepare students to be carpenters, engineers, or machinists, but it should aim to give a general training in the principles that are common to the various branches of mechanical work, so that, should choice or necessity compel the pupil to pursue these or allied occupations, he will be prepared to achieve an advanced position.

This may be called a utilitarian view, but I believe it is an injury to the pupil to give him expensive tastes, if you do not increase his earning capacity. The duty of the school, and particularly the public school, is to train for citizenship. I believe that no man can be a desirable, self-respecting member of the community who is not self-supporting.

There seems to be a general impression that there is an essential difference between the kind of training that will enable a pupil to do creative work and that which will enable him to earn his living. I believe that there is no such difference, and that the kind of training which enables its possessor to support himself leads to the creative activity of which I have spoken. If a pupil is to create, he must master his tools and materials, and this mastery comes by instruction, by practice, and by the constant repetition of the same principles and processes in varied forms.

Every man in his progress through life is accompanied by two shadows; the one before him — the ideal he would attain; the one behind him — this same ideal, transformed through action. There

are ideals in both processes and products, and it is the duty of the school to see that the pupil obtains them. The pupil must have a good method, and he can best obtain it by a careful observation of his teacher. It is necessary, not only that the thing be done, but that it be done efficiently, if the individual is to create effectively.

The ideal in construction can be partially obtained by studying constructions already made — models, if you choose to call them so. In his *Social and Ethical Interpretations of Mental Development* Professor Baldwin says :

> The child's originalities are in great part the new ways in which he finds his knowledge falling together in consequence of his attempts to act to advantage on what he already knows. . . . . The action which the child performs in any case must have an imitative character just in so far as the habit which it tends to stimulate is true to the situation outside him, which the child observes; that is, in so far as he succeeds in learning. . . . . For example, say a child sees me finger a ring. He has certain habits of action. The content of his consciousness — my fingers — tends to start the one of his habits of action which is attached to other contents most nearly like this one; *i. e.*, his own fingers. But this movement of his fingers thus brought about is imitative; that is, it is the motor expression of a presentation like the one before him — his fingers substituted for mine. This is the reason, and the only reason, why a movement takes place by which he learns.

In Professor Baldwin's book this presentation is given in connection with the young child, but I am convinced that it is the basic principle of all instruction that involves motor expression, and that it explains the fact that the best work is accomplished in those shops where careful instruction in the use of tools is given. Not only should imitation be used in tool instruction, but I believe it can be made very helpful in securing original designs. To my mind, this profiting by the labor of those who have preceded us, thus utilizing the race-experience, is one of the most important steps toward creative work.

In his *New Methods in Education* Professor Tadd pays tribute to the imitative method, which he affects to ignore, by suggesting that the work in carving be hung on the walls of the shop that the pupils may obtain hints for new designs. This matter of the proper environment is, I believe, very important. The pupil should have around him as many examples as possible of the kind of work that he expects to produce. If it is iron work, place good designs before him; if necessary, let him copy them. Do the same if it is wall designs, or machinery, or furniture; in short, give him an atmosphere of the kind

most favorable to the kind of work in hand. If this is done — and I admit it is difficult to do — I believe the results will justify the effort.

I recently visited the boyhood home of a successful architect, a man who is noted for the beauty and originality of his designs. I found the house filled with pictures of beautiful buildings and objects of art. From his childhood this man has been accustomed to seeing these things, and they have become such a part of his nature that now, when the arch or the capital is required, the design flows from his pencil without apparent effort.

The first step toward creation, then, is receptive; the second, the combination of the ideas already received; and the third, the outward expression of the new combination.

As a practical suggestion for the second step I suggest the modification of existing models. In my opinion, this is as far as most grammar-school pupils, who begin work in the seventh grade, should go. I have seen very few pupils who are capable of originating a practical design, and by "practical" I mean within their constructive capacity. The best means to bring out this feature of the pupil's idea is to have him present a working drawing of the object he desires to make. This will make him formulate his ideas, test his power to apply what he knows, and enable him to use his mechanical drawing.

The necessity of mechanical drawing has been questioned by some, but I believe this is because it is not properly understood as a means of expression. True, it is conventional, and no one ever saw, or ever will see, an object as shown on a projection drawing, but it is nevertheless better suited to all kinds of constructive work than any perspective or artistic drawing. Not only this, but it has true educational value in the training of the imagination. Actually to conceive the form of an object from its projections involves a higher degree of imaginative power than is required by any other form of representation.

If the pupil can submit a practical design, I should by all means let him make it, but I should insist that the construction be good. A bookcase through whose joints the light can be seen, or a table that will not bear weight, is not educational in the best sense. Perfection is not to be expected, but careless and slovenly work must not be tolerated for the sake of originality. It is a good thing to be able to say that a piece of work is original, but it is sad, indeed, when that is the only good thing that can be said about it.

More than this, the pupil who is allowed to do poor work does not obtain that appreciation of the ability required to do good mechanical

work that is necessary, if he is to have a proper respect for workmen in general. The defect in our industrial system is not that we have too much machinery, but that we treat men like machines. It has been claimed that we need more handwork that the product may have a more human interest. What we need is a more intelligent appreciation of the ability required by the worker. There is a general impression that the man who works with his head must have more ability than the man who works with his hands, whereas it is a difference in kind only. The teachers of manual training can do much to eliminate this false idea, if they make their pupils realize the care and ability needed for all good handwork. I believe that such a realization is more important than the carving of imaginary dragons or the drawing of impossible flowers.

In regard to decoration as a means of creative work, I think much of it can well be omitted, as it is neither artistic nor educational. In the construction of articles of furniture, for example, the first requisite is strength; next come the details of construction — the right joints used in the proper places, the proper proportion of parts; and lastly the carving or decoration. In many cases this mars the beauty of line and contour.

In his admirable article on the "Art Basis of Manual Training,"[1] Mr. Walter J. Kenyon makes a clear statement of the relation of decoration to construction, when he says:

> Decoration is most appropriate on large surfaces and prominent structural lines. A small object is usually of sufficient variety of line and individual interest to make decoration superfluous. . . . . In this connection we are safe if with Ruskin we seek, not to construct ornament, but to ornament construction. . . . . Two precautions seem advisable in the application of design to manual training: first, that the pupil be permitted to decorate his own construction only, and, second, that we have a care lest our curriculum be suddenly perceived to have two courses in design and none in construction.

I am heartily in sympathy with the belief that the decoration of articles not of his own construction has a bad moral effect on the pupil, and it was a matter of surprise to me that Mr. Tadd in his book, previously quoted, advises that chairs be purchased ready doweled together, and that then the pupils take them apart and carve them. I cannot believe that this method will secure good creative work.

I do not think that pupils of grammar-school age can spend much time to advantage in original design; a little is desirable, but, generally

[1] MANUAL TRAINING MAGAZINE, Vol. I, p. 26.

speaking, I believe the pupil will be more benefited by studying the designs of others. It is true that this so-called original work is popular, and that the pupils like to do it, but I do not think that this is a sufficient reason for permitting it.

Children like to do many things that are known to be bad for them, and it is the function of the teacher to *direct* activity. Pupils, like other moving bodies, are likely to proceed along the lines of least resistance, but these are not necessarily the best for them to pursue. I recognize, as every teacher must, the value of self-activity, but I believe it should be directed by a wise teacher along proper lines, and that, so guided, it will produce more genuine, valuable, creative work than when the pupil is allowed full freedom. Unless this is done, the pupil will not gain the strength of will and perseverance that are required by creative work.

I believe that, whatever the system of instruction and whatever the future of the pupil, the unpleasant must be faced at last, and that the child has gained most who stands ready to face it and put forth all his strength for the realization of his ideal.

If he does so and brings a difficult or unpleasant task to a successful completion, we may be sure that, whatever work the future has in store for him, he will accomplish it, not with the halting uncertainty of the amateur, but with the efficient execution that marks the master.

WHITE PINES AT WESTBURY, LONG ISLAND, PLANTED THIRTY YEARS AGO.

THE EVERGREENS.

EDWIN W. FOSTER,
Manual Training High School, Brooklyn, N. Y.

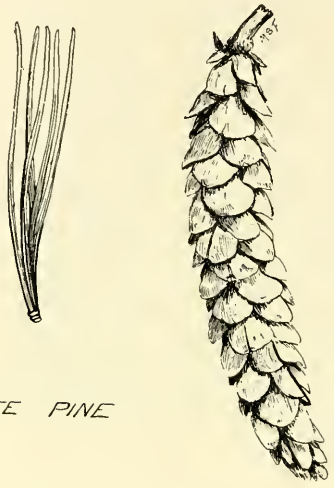
THE writer must confess his complete inability to do justice to the evergreens in a single article. The list includes not only the pines, spruces, hemlocks, firs, larches, and cedars, but such trees as the cypress, juniper, and yew. And when we know that the catalogue contains thirty-eight species of pine alone growing within the borders of the United States, the hopelessness of the task is apparent.

The term "evergreen" is not descriptive of all the members of the pine family, as the larch, bald cypress, and ghenko are deciduous, and we can hope to touch in only a superficial and general way on the subject as a rough guide to the teacher.

The pines naturally take first place, and the white pine would head the list in the East, probably to be replaced on the Pacific coast by the sequoia. It is only in recent years that Americans in general have come to realize that not only is the white pine the most valuable of the

evergreens economically, but the most beautiful and ornamental as well. The needle is fine and delicate, of a beautiful light-bluish green color, and from three to five inches long.

Pines can be distinguished by the grouping of their needles, by the seed cones, and by the general habit of the tree. The white-pine needles are grouped in fives; the drooping cone is from four to six inches in length and an inch in diameter. The bark is the smoothest found on American pines, and the tree is one of the tallest and most majestic to be found in the forest. Thanks to the ruthless energy of the American lumberman, we appreciate the value of white pine now that the magnificent forests which once covered our northern states are no more. The visible supply is so small and prices so correspondingly high that we wonder how we could ever have wasted it as we once did. The wood is light in color and weight, with a straight grain and freedom from sap which adapt it to many purposes. The pattern-maker will miss it as much as anyone, owing to the ease with which it could be worked and the fine way it took glue.



WHITE PINE

From the lumber point of view, two other members of the family stand out prominently, the southern yellow pine, Georgia pine, or long-leaved pine, as it is variously termed, and the yellow pine. These two trees must not be confused, and need not be when we are familiar with their needles. The Georgia pine has needles from ten to fifteen inches in length, growing three in a group, and its cones are from seven to ten inches long, while the yellow-pine needles are short, about three or four inches long, with small cones only two inches in length. Georgia pine lumber is the more valuable of the two, although yellow pine is a very handsome wood, used for flooring, ceiling, and a variety of purposes. It must be recalled also that lumber is not the only product of these trees, as turpentine, rosin, and tar are produced from the sap.

Besides these three important members of the family, we have, on the Atlantic coast, the red, Norway, or Canadian pine, the loblolly or old field pine, the pitch or torch pine, the gray or jack pine, the Jersey scrub pine, etc.

The spruces furnish lumber of a quality inferior to pine, yet valuable for many purposes, such as house-framing, etc. The habit of the trees is very different from that of the pines, being compact, tall, pyramidal, and with short needles, not grouped as in the pines. Four varieties are common, the white, red, black, and Norway. The latter is an importation from Europe, being the famous evergreen of the Alps. It flourishes on American soil, where it has been grown for years, and is an ornamental tree of considerable merit. Its wood is known in Europe as deal. The differences between the three American species are rather slight, and there seems to be some difference of opinion as to whether or not the red is a variety of the black. All are essentially northern trees, the black spruce luxuriating in the bleak climates of Labrador and upper Canada, and not thriving well below the Adirondack region. The needles, about half an inch long, clothe the twigs on all sides, and the cones are about an inch and a half long. Besides being valuable for house-building, spruce is used extensively for the sounding boards of musical instruments and for making wood pulp.

WHITE PINES BENT WITH ICE.

Again, from the lumberman's point of view, and furnishing wood inferior to both the pine and the spruce, is the hemlock. Its lumber is neither strong nor durable; but here the comparison changes, as the hemlock ranks next to the white pine as a beautiful evergreen. Unlike the heavy dense foliage of the spruce, that of the hemlock is light, airy, and graceful. I cannot improve on the words of F. Schuyler Matthews when he says:

There is no phase of tree life more beautiful than that presented by the hemlock clothed in its springtime garb; the tips of the dark-green sprays are painted in yellow-green, with a fairy-like daintiness, the effect of which could only be conveyed to the mind by a careful study in color.

This tree is found over a large area from the Atlantic to the Mississippi and southward to Georgia, reaching its greatest development in North Carolina and Tennessee, attaining occasionally a height of ninety and a hundred feet. The bark is rich in tannin, and large areas are sometimes deforested solely for the bark of the hemlock. The cones

BLACK SPRUCE.

HEMLOCK

are tiny brown affairs, about half or three-quarters of an inch long, and the needles, flat and blunt at the end, are about the same length.

The balsam fir is our common Christmas tree, and might superficially be confounded with the spruce. Such an error, however, is needless, as the balsamic odor alone is a sufficient means of identification. The general habit of the tree is spruce-like, although the needles are blunt, even more blunt than those of the hemlock. The lumber is of little value, but the health-giving qualities which this tree imparts to the sections where it flourishes make it a very desirable one. Its wonderful healing powers in certain lung troubles are well known, and Canada balsam is made from the contents of little blisters which are found on its bark. Visitors to the balsam woods gather the green needles in large quantities and make of them pillows, which have a soothing and sleep-compelling effect.

Any enthusiast on this subject is inclined to use superlatives, yet the truth seems to warrant such weakness, if it be a weakness. It is so easy to exclaim: "Isn't it beautiful! Isn't it magnificent!" And

yet, after all, isn't it grand to have the feelings of which these exclamations are the spontaneous expression? How natural it was for a man like Emerson to take off his hat to nature! Have you ever seen the larch in its spring dress? If not, you have missed one of nature's glories.

The larch is a deciduous evergreen, its needles turning yellow and falling at the end of their first season. This tree, sometimes called the tamarack or hacmatack, is primarily a swamp dweller, but can exist

on the upland if necessary. The needles grow in groups or bunches along the branchlets, and the cone is about the size of that of the hemlock. Its wood is heavy, hard, and durable, although coarse-grained, and is used for fence posts, telegraph poles, etc. The larch usually planted on lawns is a European variety, which thrives here, and is considered by some even more handsome than the American.

It is interesting to note how, when the supply of a common necessity gives out, we immediately discover something to replace it. There was a time, about a decade ago, when all furniture to be in the fashion must be made of black walnut. The supply of walnut gave out, other woods replaced it, and now a piece of black-walnut furniture does not even interest us. A typical instance is in the discovery of the bald cypress of the swamps along the Gulf. Twenty-five years ago this tree and its wood were little known. The supplies of white pine and other woods became exhausted. It was noticed that the swamps were full of handsome cypress trees. Today cypress is a

well-known and valuable commodity in every lumber market. This is also a deciduous member of the evergreen family. The needles are very small, delicate, and feathery, averaging half an inch in length, and the cones, nearly round, are an inch in diameter. The cypress, like the larch, is a water-loving tree and grows throughout the southern states as far as Mexico. It may be distinguished by its very tall, spire-like growth and the delicacy of its foliage. The wood is exceedingly valuable, being durable in exposed places and having a beautiful grain with sharp variations in color, from almost white to very dark brown, bordering on black, the general color tone being a reddish brown. It is therefore valuable for cabinet work and interior finish, although having a tendency to brittleness in working.

The cedars comprise a valuable branch of the pine family, and the jump from fence posts to lead pencils is really not such a jump as one might imagine, when we realize that these two uses represent the two good qualities of cedar, viz., durability and ease in working. The red cedar known throughout the North as a small but artistic tree is very widely distributed throughout the United States, but reaches its greatest development in the southern states, where it sometimes attains a height of ninety feet. Indeed, Florida has practically supplied the world with its lead-pencil material for several generations, and it is said that during the blockade of the southern coast during the Civil War pencil manufacturers scoured the earth to find a substitute for the Florida cedar. This tree seems to occupy among evergreens a position analogous to the mulberry among broad-leaved trees, showing considerable variation in its leaf-forms. Indeed, it has practically two types of leaves, awl-shaped and scale-shaped. The needle-like or awl-shaped leaves are particularly noticeable on the young growth, but both kinds are found on the older parts. The blue-green berries, familiar to every country boy, ripen during the second season. Red cedar, as its name implies, is red in color when cut, but fades on exposure. It is soft, close-grained, aromatic, not very strong, but very durable, and its uses cover a wide range, including interior finish, lead pencils, posts, and railroad ties. Its odor is said to be repulsive to moths, and clothes closets and chests are frequently lined with it as a means of preserving the contents from these insects.

White cedar is the swamp relative of the red variety, and is found in the swamps along the Atlantic seaboard and the Gulf coast to the Mississippi. It may be readily distinguished by its finer foliage, its symmetrical shape, and the lighter, softer wood. Although soft, the

wood is durable under many conditions, and is used for shingles, fence posts, and in boat-building.

The arbor vitae, called in some sections "white cedar," is a distinct variety, and may be distinguished from the true white cedar by its decidedly aromatic odor and the unusually flat leaf-sprays and branchlets. This small tree was a favorite hedge plant for some years, but is being gradually replaced by the California privet. Its wood, like that of all cedars, is soft but durable in contact with the soil, and is used for fence posts, etc.

CYPRESS

ARBOR VITAE

It is outside the province of this article to mention the many interesting evergreens of the Pacific coast, yet a word of tribute should be given to the celebrated redwoods, *Sequoia sempervirens*, and the "big trees," *Sequoia gigantea*. The name "Sequoia" comes from Sequoyah, the name of a Cherokee Indian, and we need only call attention to the age of the giants to appreciate their value. Twenty-five hundred is easily written, yet to realize that when Columbus sailed into American waters these veterans of the forest had already seen twenty-one centuries gives the figure new significance.

The redwoods, although not so large, are more widely distributed than the "big trees." An enthusiastic writer, in speaking of the redwoods, says :

Not in sentinel groves, but in one continuous belt — dense, stately, dark, and forbidding. The forests are apparently imperishable except through the

axe of the woodsman, and this is wielded with care. The trees are never injured by fire. The wood resists combustion, and is hard to burn even when dry. The redwood is the only lumber that can take the place of the white pine, answer as a satisfactory substitute for mahogany and black walnut, displace oak for redwood ties, cypress and cedar for shingles, and surpass all other woods for durability when in contact with the earth, or when exposed to moisture. These qualities make the redwood industry important to the builders of cities and homes, of railroads, flumes, and conduits; to those engaged in mining, manufacture, and agriculture all over the country. It is important to the consumers that there is still a reserve forest containing 50,000,000,000 feet of timber. Redwood will make an enduring foundation, solid walls, and an imperishable roof. Thus it provides the substantial equipment of any structure; but it may be made to adorn the home, as well as shelter the inmates. As a finishing wood it is unequaled.

ASSOCIATIONS.

CONNECTICUT STATE TEACHERS' ASSOCIATION.

THE annual meeting of the Connecticut State Teachers' Association was held in Hartford, October 18. The morning session was devoted to general topics and round tables, and the afternoon to meetings of sections. The principal address of the morning session was by Dr. Arnold Tompkins, president of the Chicago Normal School. His topic was "Altruism."

The manual-training round table was well attended, and several interesting subjects were discussed. The topics were presented in the form of questions, the first one being: "Eighty minutes for manual training, no mechanical drawing. Is it advisable to take the time allowed for the former to teach the latter?" In the discussion of this question the opinion prevailed that a third of the time should be devoted to constructive drawing in the upper grades, and more in the lower.

Second: "What relation should the mechanical drawing bear to the woodwork of the grammar grade?" In the lower grades the drawing of every model should precede its construction, but in the upper grades this does not necessarily hold good. When the pupil has fixed in his mind the relation between the drawing and the model, can read a simple drawing, and also make one from the model, the time has come for the introduction of other than working drawings. In fact, simple geometrical drawing should be taught from the beginning.

Third: "How many periods per week in manual training, and how long periods, may be profitably given to pupils in the first four grades?" In the first and second grades it is believed that a half-hour lesson should be given each day; in the third and fourth, three half-hour lessons per week; in the fifth and six, two lessons per week of forty-five minutes or one hour each; and in the seventh, eighth, and ninth, two lessons of an hour each.

Fourth: "Is a one-hour period per week in manual training sufficient for pupils above the first four grades?" No. One and one-half hours is a minimum.

Fifth: "What is the best method of presenting woodwork to a class of beginners of an average age of ten years?" First, use the sloyd knife in free-hand whittling, to be followed by the saw, turning-saw, hammer, and spoke-shave on that class of models which brings into use the larger muscles and groups of muscles. Make boats, rough boxes, bird houses, toys, and useful articles out of stock as it comes from the mill, *i. e.*, double-surfaced and jointed, no planing to be done by the pupil. Such work should be followed by that which requires more accurate construction, and involves the plane, back-saw, chisel, bit, and other tools. A small amount of construction may be carried along well with the knife, thus working toward accuracy.

Sixth: "If a pupil ruins a piece of work, should he be required to do it over until a good piece is made?" Not necessarily; all depends upon circumstances. If a pupil has worked carefully, intelligently, and the failure is due to an accident or lack of skill, it is not essential that he do it over again. We learn as much, and sometimes

more, through our failures as we do through our successes. The educational motive may be satisfied, although incidentally the model is ruined. On the other hand, if a pupil expresses a desire to try again, he should be allowed to do so in order to satisfy his desire to succeed. Or, if he has been inattentive, careless, or malicious, and thereby has spoiled his work, he should be required to do it again.

Seventh: "How far shall a boy be encouraged to work out his own schemes rather than follow a prescribed course?" To the fullest extent possible.

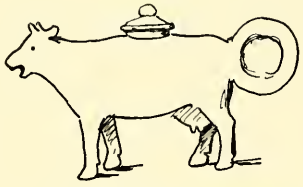
Eighth: "What kind of profitable work can be done in the lower grades with least expense?" Clay-modeling, raffia, basket-weaving, cordwork, paper and cardboard work.

Ninth: "Manual training a fad; what can be done to eradicate this idea?" Also,

Tenth: "How can school officers be brought to see its value?" By making manual training, where already established, so successful and effective that school officers and people generally will see its value and recognize its utility. This will necessarily take some time.

Eleventh: "Shall the manual-training teachers of the state form an organization?" This was discussed at some length, but it was finally decided, in view of the fact that the number of manual-training teachers in the state is so small, it would not be wise to form a separate organization, but rather to work through the state association. A plan to issue a bulletin of information through the state board of education was proposed and discussed.

A few other topics were also on the program, but were omitted for lack of time. —CHAS. B. HOWE.



A "Free" design for a cream pitcher -

FIG. 1.

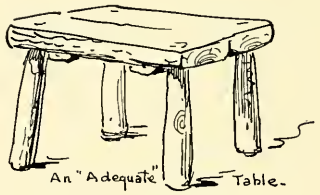


FIG. 2.

MASSACHUSETTS TEACHERS' ASSOCIATION.

THE fifty-seventh annual meeting of the Massachusetts Teachers' Association was held in the main hall of the English High School, Worcester, Mass., Friday, November 29, 1901. Many able speakers were on the program, but the talk in which we were most interested was upon "Artistic Manual Training," by Mr. Henry T. Bailey, state instructor in drawing and agent of the state board of education.

Mr. Bailey based his remarks on this definition of fine art by Hegel: "Fine art is the free and adequate embodiment of the idea in a form peculiarly apprporiate to the idea itself." His illustrations on the blackboard were very interesting. His first

sketch was a free design for a cream pitcher (Fig. 1). This he described as "free," but not "adequate" or in a "form appropriate." The next was a sketch of a table (Fig. 2), "adequate," but not "free" or in a "form appropriate" according to our present ideals. Good art is the free *and* adequate embodiment of the idea in a form appropriate to the idea itself.

His next sketch (Fig. 3, A) was of an old-fashioned hanging lamp in which olive oil was burned. It was a beautiful and appropriate form with four tubes for wicks from which are four chains meeting above in a single larger chain for suspension. This is free, adequate, and in a form appropriate to the idea itself; hence, a piece of fine applied art.

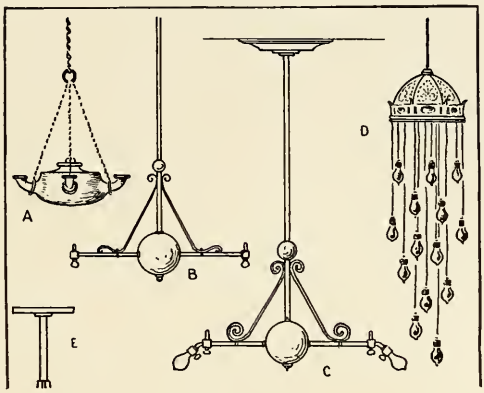


FIG. 3.

He led from this to the usual form of hanging gas fixtures (B). The receptacle for oil, no longer necessary, is apparently retained. The radiating tubes are longer and with added details. The spreading support, no longer required, is echoed by the ornamental appendages which have no organic relation to the whole. This is distinctly not fine art. Gas was an entirely new idea and should have had an appropriate form of fixture. Then again, when electricity came, the designers, as a rule, added another hideous detail to the already inartistic gas fixture, by sticking down the bulb, as per sketch C, a form to be found almost anywhere.

He then drew special attention to the artistic clusters (D) by Blackall and Newton in Tremont Temple, Boston, Mass., as an example of fine applied art; "free, adequate, and in a form appropriate to the idea itself"—electricity.

Mr. Bailey made excellent suggestions for grammar-grade work, using apt illustrations and specimens of pupils' work, among which an artistic pencil sharpener and case, and a small desk calendar, were of especial interest. On the calendar were shown the day of the month, the day of the week, and the month of the year, on rolls with small projecting knobs at the side for turning the rolls to the required day. He advocated the buying of such material as rolls and knobs, which in actual practice are always made by machinery in these days. The rolls should come to the school in the form of dowels of the required size, and the knobs should be made in bulk by machinery, from a drawing made in school. The pupil should realize the advantage of this twentieth century and its wonderful machinery. He is more interested in the Waymouth lathe than the wearisome and useless additional exercise. Mr. Bailey is opposed to the petty whittling exercise where accuracy is the only essential. He believes in the exercises of such interest that the "pupil will put the yoke upon himself." If the pupil is inspired by the proper example, he will hold himself to a higher standard by harder work, and attain better results than the slave-driving teacher can secure. Mr. Bailey cited as an example one boy who voluntarily made three of these calendars before he was satisfied. The boy wanted one that would "work," so he became his

own task master, and was not satisfied until his calendar was exactly right.— LUTHER W. TURNER.

PACIFIC MANUAL TRAINING TEACHERS' ASSOCIATION.

A MEETING of the Pacific Manual Training Teachers' Association was held at the State Normal School, Los Angeles, on Saturday, November 16. President Chamberlain called the meeting to order at 10:45 A. M.

Mr. Frank H. Ball, of Throop Polytechnic Institute, gave the opening paper of the day. He treated his subject, "Mechanical Drawing as a Factor in General Education," in such a way as to show its value in mind-development and its application to all students, irrespective of the especial school course being followed. The relation of freehand to mechanical drawing was shown to be intimate, and the close connection between delineation and construction brought out.

While drawing is not a "universal language" in Mr. Ball's estimation, it has great value as a means of expression. Mechanical drawing should begin in the fourth grade, and be based largely upon the constructive work done. In advanced classes, however, some copying of projects may be carried on.

A well-wrought-out drawing bearing poor and careless lettering is a "misfit." Care should be taken to have clean, legible lettering in all cases.

In the experience of those who discussed this paper, pupils generally were less interested in the drawing of models and projects than in the actual construction of them. The suggestion was made that the drawings were usually too difficult in the beginning, hence the constructive work should be simplified to meet the abilities of pupils. It was further suggested that drawing of two dimensions only should precede the complete working drawing.

After a delicious luncheon, served by Mrs. Hazzard and Miss Anderson, of the domestic economy department of the school, the visiting members were privileged to examine an exhibit of various lines of constructive work done in the normal school. The afternoon session being called, Mr. Charles M. Miller, of the normal school, read a paper on "Occupations." This was followed by a paper on "Cardboard Construction; Its Place in the Primary School," by Miss Ella V. Dobbs, of Los Angeles.

Mr. Miller gave in outline his ideal of manual training, naming many and varied occupations, and dwelling at some length upon certain of them. It is possible, he said, to lay too much stress upon any one form of work — cardboard, for instance — to the exclusion of other things. The child becomes weary of working with the one material. In the judgment of the speaker, the twig work presented a rich field for study. The twigs could be easily procured, were cheap, and with small brads could be so fastened together as to lend themselves to a variety of forms and uses. Boxes, baskets, tables, history materials, as the Ulysses raft, etc., were easily made. In grades above the sixth more stress should be placed upon one material — work with wood at the bench.

Miss Dobbs brought out clearly and forcibly the great vulue of paper materials in the primary school. The study of color can be nowhere so well carried on as when dealing with these materials. The pupils have the greatest enthusiasm for the work, and carry away the models for use in the home. Many parents, said the speaker, are being converted to the manual-training spirit through their respect for this work.

The two papers brought forth one of the most spirited and vital discussions

coming from teachers of our craft, based largely upon the idea of many or few occupations for young pupils. Mr. Miller insisted on his ideal of many phases in handwork, while Miss Lena Ingraham and Mr. Charles Kunou took the ground that we were scattering our educational forces in too large measure, and, in our endeavor to bring so much to the pupils, many were getting little of real value, our methods being such as to confuse the mind with a heterogeneous mass of materials.

The members of this organization feel that they have one of the most active and useful manual-training associations in the country.—ARTHUR H. CHAMBERLAIN.

BREVITIES.

THE next meeting of the Department of Superintendence of the National Educational Association will be held in Chicago February 25, 26, and 27, 1902. Copies of the program can be obtained from Secretary Irwin Shepard, Winona, Minn. A long list of able speakers and a great variety of subjects are announced. By many the annual meeting of this department is looked upon as the best of all the educational gatherings of the year.

ALL who are planning to attend the next meeting of the Eastern Manual Training Association will be interested in the following facts taken from a letter recently received from Mr. C. B. Connelley, supervisor of manual training in Allegheny, Pa. At the time of this meeting there will be a great educational feast in Pittsburg. The Pennsylvania State Teachers' Association and the American Society for the Advancement of Science will convene during the same week as the Eastern Manual Training Association. The local committees of these organizations are working together and making large plans for the entertainment of their guests. One feature of these plans is a series of excursions through the great industrial establishments for which Pittsburg is noted. Nor will opportunity be lacking to visit manual-training schools, for Allegheny now has six, with eleven teachers, and Pittsburg has eight, including four for domestic science. The officers are planning a strong program, and are already able to announce Professor John Dewey, of the University of Chicago.

THE high school at Fort Smith, Ark., claims the distinction of having the only organized manual-training department in the public schools of the state.

THE Walker Manual Training School, a gift to the city of Portland, Me., was dedicated November 8.

THE manual-training work in Des Moines, Ia., is growing so rapidly that Mr. A. C. Newell, the supervisor, has been looking for another assistant. Besides the fine equipment in the West High School, Des Moines now has five grammar-school equipments for woodworking. Pupils from five other grammar schools go to the high school for instruction in woodworking. In the lower grades work has begun in weaving, basketry, and paper and cardboard work.

THE first regular meeting of the Council of Supervisors of the Manual Arts was held in New Haven, Conn., December 6 and 7. The purpose of this society is the critical discussion of questions concerning the advancement of drawing, designing, and constructive work in the public schools. It is limited to an active membership of forty and an associate membership of one hundred. At this meeting

the following papers were discussed: "Single-Handed Supervision in Cities," by Frederic L. Burnham, discussion led by William J. Edwards; "The Supervisor as an Influencer of Public Taste," by James Hall, discussion led by Frederic L. Burnham; "Principles of Teaching Constructive Design," by Henry T. Bailey, discussion led by Victor I. Shinn; "Venetian Iron Work for Elementary Schools," by William J. Edwards, discussion led by Frederic L. Burnham; "The Phychologists on the Teaching of the Manual Arts," by Victor I. Shinn, discussion led by James P. Haney; "The Manual Arts in Elementary Schools," by James P. Haney, discussion led by James Hall; "The Relation of Elementary Art Instruction to the Technical Schools," by Theodore M. Dilloway, discussion led by Charles F. Whitney; "A Theory of Color in its Application to School Work," by Ernest Batchelder, discussion led by Carlton C. McCall; "Normal Preparation in Manual Arts for the Grade Teacher," by Charles F. Whitney, discussion led by Henry T. Bailey.

There was an informal discussion upon design Friday evening, illustrated by examples showing different courses of design for the grades.

The meeting was a most profitable one, and the discussions were most suggestive. The following people were present: Henry Turner Bailey, Massachusetts; Frederic L. Burnham, New Haven, Conn.; William J. Edwards, Malden, Mass.; James Hall, Springfield, Mass.; James P. Haney, New York city; Carlton C. McCall, Harrisburg, Pa.; Victor I. Shinn, Brooklyn, N. Y.; Charles F. Whitney, Salem, Mass.; Alfred V. Churchill, New York city; Michael Murray, Springfield, Mass.; Miss Julia C. Cremins, New York city; Miss Lillian M. Dearborn, Quincy, Mass.; Miss Beccie Lewenthal, New York city; Miss Elizabeth H. Perry, Bridgewater, Mass.; Miss Louise Pierce, New York city; Miss Ida Teed, New York city; Miss Florence C. Tarbell, Springfield, Mass.; Miss Mabel E. Stock, Springfield, Mass.; Miss Harriet Hitchcock, Brookline, Mass.

The yearbook containing the papers by the members may be bought of the secretary, Dr. James P. Haney, Park avenue and Fifty-ninth street, New York city. Price, $3.

RICHMOND, IND.

THE manual-training department of the public schools of Richmond, under the management of Supervisor W. S. Hiser, has had a gradual and healthy growth, and now is complete from the kindergarten through the grades. This year a center for seventh- and eighth-grade work in wood has been fully equipped with modern tools and benches, and the results have already added to the feeling that some form of manual training must extend through the high school. The work in the lower grades, consisting of cardboard construction and work in colored cover paper (tools: the compass, triangle, rule, punch, and scissors), is conducted almost entirely by the regular teachers under the guidance and instruction of the supervisor of manual training. Supervisor Hiser is to be congratulated upon the high standard to which he has brought the work and the successful manner in which he has built up the department from a small beginning.— E. A. BENDING.

BOSTON.

A WOMAN'S "tech" is to be opened in Boston soon — probably next year. It is to be called Simmons College after the founder, Mr. John Simmons, a Boston merchant who died thirty years ago, leaving an estate which has accumulated and now amounts to $2,500,000. The college was incorporated two years ago. Recently the

trustees have taken an important step in its organization by electing Dr. Henry Lefavour, the dean of Williams College, to the presidency, and by appointing as dean Miss Sarah L. Arnold, a supervisor in the public schools. No site has been selected, but it is expected that the college will be opened next year in Boston and that the permanent home of the institution will be within the limits of the city.

The aim of the college is to fit young women to earn their own livelihood, and to this end four groups of professional courses have been proposed, and along with these a large number of liberal studies will be pursued. Among the professional courses will probably be the following:

1. Business course — library technique, shorthand and typewriting, fitting for private secretaries and confidential clerks; also instruction in dressmaking and millinery.

2. Horticultural course — fitting for market gardening, also for landscape gardening and floriculture.

3. Applied arts — designing for book covers, posters, textiles, pottery, wall paper, etc.

4. Domestic economy — fitting housekeepers for positions in large hotels and apartment houses, as well as in private homes; also the training of matrons and superintendents for institutions.

The admission requirements will be the preparation usually furnished in good high schools. There will be no dormitory system, and the rate of tuition will be less than is usually charged in the older colleges.

THE Chapman school, East Boston, has been repaired and contains a manual-training room much superior to the old one. Mr. Alexander Miller is in charge of the manual-training work in this school.

THE Winship primary school in Brighton has a fine new room for manual training, which will take pupils from the Bennett school. The building also contains a model cooking-room with individual equipments throughout.

IN the Sherwin school, Roxbury, a room has been fitted up for manual training. The work has already begun, under the direction of Miss Sigrid Cederroth. The Lewis school, Roxbury, is having a special building erected in the yard for its manual-training work.

THE Manual Training Club reorganized this fall, with Mr. George F. Hatch, of the Eliot school, as president; Mr. C. W. Hunt, of the Milton school, as vice-president; Alexander Miller, of the Chapman school, as secretary; and Mr. Frank Carter, of the Prescott school, as librarian.— JOHN C. BRODHEAD.

NEW YORK CITY.

MEETINGS of the shopwork instructors of the public schools of Manhattan and the Bronx are held monthly, Dr. James P. Haney, supervisor, presiding. In discussing the work of the term at the December meeting, Dr. Haney laid strong emphasis upon the development of the creative powers of the pupil. The boy should be taught not only to solve the problems presented to him, but to invent problems to be solved. No opportunity should be lost of bringing the work of the shops to the notice of parents and persons of influence in the neighborhood of the school, and instructors should exert themselves to disseminate a better understanding of its value. Dr. Haney believed the day was not far distant when the manual arts would be the center around which the school curriculum would be formed.

From about the middle of December to the end of the term, January 31, the time,

in the workshop is given to "supplementary" work consisting of articles made from the pupils' original designs.

THE greater part of the fortune of the late Professor Thomas Egleston, founder of the School of Mines of Columbia University, was bequeathed to the rector, church wardens, and vestry of Trinity Church for the support of "schools for training the young of both sexes how to use the faculties which God has given them in such a way as honestly with their own hands to earn their own living." The income from this fund will be devoted to the maintenance of industrial schools, or departments connected with the various parochial schools under the control of Trinity corporation, the most important among these being the School of Manual Training of Trinity Parish. This school, formerly connected with St. John's Chapel, has recently been enlarged and reopened at 35 Washington square, once the residence of the donor.

AT the October meeting of the New York Manual Training Teachers' Association the principal subject of discussion was incidental instruction, the object being to determine how far the shopwork instructor might profitably go outside of the line of teaching necessary for the work in hand. The opinion prevailed that, because of the limited time given to manual training, little should be undertaken beyond the strictly technical instruction and some practical talks about the tools and materials used.

The November meeting discussed several interesting points with reference to mechanical drawing, the instructor's responsibility with regard to it, and its relation to the work at the bench.

THE faculty of Teachers College has recently completed a revision of the courses of study and the plan of awarding diplomas. The three grades of diplomas in future will be known as the bachelor's diploma, the master's diploma, and the doctor's diploma. The first will be awarded to all students successfully completing undergraduate courses according to existing arrangements. The master's and doctor's diplomas take the place of the secondary and higher diplomas formerly issued, and are awarded to students in any department in which graduate courses are offered, the department of manual training being among the number. Departmental certificates are issued as heretofore.—WILLIAM F. VROOM.

OHIO.

ONE of the most prominent features of the annual meeting of the Federated Women's Clubs of Ohio, held at Dayton during the first week of November, was a manual-training exhibit, secured by the committee on education. To quote Mrs. Frank Conover, chairman of the committee, the purpose of this exhibit was "to show the club women of Ohio from the smaller cities and from places where they have no manual training, what is being done in their own state."

Cleveland was well represented by a display of excellent photographs showing the work in the different grades and the high school. The photograph of the new center for grade work attracted much attention on account of the fine, yet inexpensive, equipment it showed. The Cincinnati vacation schools, through the kindness of Mrs. Parrott, of Bavaria, contributed a liberal display of drawings, raffia, cardboard, sloyd, and sewing. Those interested pronounced the vacation schools an unqualified success, and the quality of the work done in them verifies the statement. The Cincinnati Orphans' Home showed some excellent work in cardboard, sloyd, and sewing.

By far the larger part of the exhibit was from the local manual-training school. Being on the ground gave this school a decided advantage. The exhibit consisted of

pupils' work from the grades and the high school, showing courses and special work in sewing, freehand drawing, designing, mechanical drawing, clay-modeling, bench-work in wood, carving, turning, Venetian iron, and pattern-making. The wood-carving, being mostly on well-made pieces of furniture, attracted much attention.

The drawing department of the public schools, Miss Woodmansee, supervisor, also occupied a great deal of space with a splendid showing from all grades. Form-work, based on geometrical problems and geometrical designs rendered in color, attracted much attention on account of the originality displayed and on account of its being in a form of manual training that can be carried on anywhere at no additional expense.

The exhibit as a whole brought forth much comment favorable to manual training, and it has done more, perhaps, than any one thing in Ohio for the good of the work and its future.—E. A. BENDING.

CALIFORNIA.

AT the San José state normal school, Mr. James E. Addicott has placed the manual arts upon a firm foundation, and the influence of the work is felt not only throughout the school, but in all schools taught by the normal graduates as well. Elementary paper- and woodwork, sloyd, carving, cardboard construction, and other lines of work are carried on. The aim is to have nothing in the course that is not of direct assistance to teachers. The "cardboard mensuration" work is perhaps used more by teachers than any other part of the manual-training course. Probably more time has been given to the cardboard construction than ever before, and the results show splendid work.

AT the San Diego state normal school, the most recently organized of the five normal schools of the state, bent-iron work and mechanical drawing have been introduced in the preparatory department. Mr. W. S. Wright is the instructor. Raffia work, reed-weaving, and cardboard construction are being considered.

AVERY F. SEARLE, who last year was principal of the Coronado high school, San Diego, is engaged at Honolulu, H. I. He expects to introduce manual training into his school the current year.

MANUAL training has just been introduced into the schools of Tulare, with Miss Kate B. Beckwist, a graduate of Throop Polytechnic Institute, as instructor. The double benches to be used were made in the southern part of the state after designs by A. H. Chamberlain. Two lines of work only will be undertaken in the beginning, cardboard construction and sloyd.

THE Harvard Military School of Los Angeles has strengthened and enlarged its work in manual training by placing Miss Genia A. Hunt in charge. Cardboard and bench-work are to receive most attention. Miss Hunt purposes to bring the drawing and the constructive side into close relationship with each other, and to form a rational correlation wherever possible.

IN southern California educational movements are not radical, and perhaps this is why the growth of manual training has been so steady and has made such advancement during the past few years. The Los Angeles city schools can show in manual training (Mr. Charles A. Kunou, supervisor) educational results not to be surpassed. In these schools the teachers are all women, save the supervisor and one other. Since cardboard construction has been placed in the third and fourth grades, the constructive work from fifth grade on has been materially aided. While a comparatively

rigid course is laid down, each teacher consults in some measure the needs and conditions of the individual pupils, and encouragement is given to bring in original designs. The delineation in these schools is especially fine.

SAN FRANCISCO.

BENCH work in the grammar grades of the San Francisco schools is now in its second year. As yet the work is confined to the seventh and eighth grades, each pupil receiving one lesson of an hour and a half to two hours per week. Each teacher instructs three classes per day — about 300 boys per week. The maximum size of classes is 26 pupils. The manual-training work is credited with 50 points out of 600 for promotion of pupils. The seven laboratories in which the work is carried on are equipped with individual benches, tool cabinets, lockers for pupils' work, lumber room, etc. The city probably has the finest equipment in the country for grammar-grade manual training.

The boys are all taught to make and to use working drawings of simple objects. To facilitate the mechanical drawing, each bench is provided with an attachment (devised by the supervisor, Mr. Cree T. Work) whereby it may be quickly transformed into a drawing table. Beginning in the near future, the lower grades are to be trained in making working drawings as a part of the regular course in drawing, thus greatly relieving the manual-training department.

In selecting models to be made, not only are the interests and environment of pupils taken into consideration, but the individuality and interests of the teacher as well. No two of the teachers make the same things — the same series of models. This is one place where the teacher's individuality and preferences are consulted. Is there "sequence" in the models made? Yes, but not of the hair-splitting kind. It is a logical sequence based on practical conditions as they are found to exist. In some cases it seems to reverse the order of "exercises" as advocated by the books. But neither the supervisor nor his assistants feel disturbed at the overturning of some writer's pet theory so long as they can see improved results as a consequence.

That the manual-training teachers of San Francisco are wide-awake is further evinced by their lively fortnightly meetings, at which the work in its different phases is discussed, analyzed, criticised, planned, illustrated, and demonstrated. The free exchange of views and experiences which is encouraged at these meetings does much to stimulate and help in carrying forward the work.—A. H. CHAMBERLAIN.

ILLINOIS.

MR. ARTHUR B. FAIRBANKS, who for several years has been in charge of the manual-training work in Oak Park, Ill., leaves on February 1 to assume the directorship of manual training in the University School of Detroit, Mich. Mr. Fairbanks leaves many friends in Illinois, where he has been looked upon as one of the most successful teachers of manual training in the state.

EVANSTON has a new school of manual training and domestic science, which was opened to public inspection on November 29.

MR. J. K. STABLETON, the new superintendent of schools in Bloomington, is encouraging an interest in manual training. Weaving, basketry, and paper-construction work are being introduced into the primary grades, and it is hoped that woodworking can be begun in the high school before long. The appointment of Miss Cora M. Hamilton as supervisor of primary work is an important factor in this new development.

CHICAGO.

THE dearth of manual-training teachers who are wanting places has become quite noticeable. A few years ago men wishing places to teach manual training were plenty. Today they are difficult to find. What is the cause of it? Is it on account of the better condition of business, or is it because the colleges are not turning their graduates in that direction? I have had requests for teachers from various directions in the past few months that I could only answer by saying that I did not know anyone suitable for the place who was not engaged. In fact, I had great difficulty in filling two vacancies in my own school. The manual-training idea is spreading, and any young man who has the skill, and training and tact enough to teach, will find no difficulty in securing a place. Salary may be small to start with, but anyone who makes himself a necessity to a community will be sure of a living.

THE English High and Manual Training School still occupies its factory quarters. The site has been purchased and the plans are completed for the new building, and we still wait. The enrolment so far this year is 675. About fifty more will be added to this in the near future by the admission of the apprentices of the Chicago Mason and Builders' Association. By the rules of this association all the apprentices who are in the employ of its members must be sent to school during the months of January, February, and March of each year. No union man is allowed to work on a building where any apprentice is at work during these months. If the apprentice is not able to furnish a certificate from the school showing his attendance, he is not allowed to return to work. As the apprentices are paid from $250 to $400 per year, according to the year of their apprenticeship, this is no small thing, and insures prompt and regular attendance and good behavior. We had six of this class in attendance last year. They were given work in arithmetic, shopwork, and drawing. No special plans were made for them, but they were placed where we could accommodate them best. This year fifty-three are expected. A room has been secured, and will be fitted up for their use. Some plan of study is being formulated for their instruction. It will be much on the plan of an old-fashioned country school during the winter term, when the farm work was all done and the big boys came to school. Everything from the alphabet to geometry will be taught, as some of the boys can scarcely read English, and some of them have done work in a high school.

I can see the beginning of great things in this. Here is one of the spots where the periphery of the educational wheel has touched directly the trades-union question.

SUPERVISOR R. M. SMITH is busy preparing a course in manual training for all of the grades of the elementary schools. It is a difficult task to co-ordinate such a course with the other studies in the lower grades. The six-year-old is a sworn foe to conventionalization. He wants to do things, but wants to do them in his own way, and I rather think he is right.—ALBERT R. ROBINSON.

PEORIA.

UNUSUAL interest in manual training is manifest this year in Peoria. Early in November the formation of a basketry guild was announced at Bradley Polytechnic Institute, with Miss Adelaide Mickel as master-craftsman. The purpose of the guild was to encourage basketry as a home craft, and to show its practicability as a manual-training subject in schools. It was thought that a small company of from fifteen to twenty people would like to become members of such a guild and make baskets together once a week during November and a part of December. Instead of twenty,

one hundred and forty names were soon on the guild book, and several were refused admission because of lack of accommodations. It is probable that these will be allowed to join the guild some time during January or February. At the close of the work in December over sixty members wished to continue in the work during the remainder of the year. A more permanent form of organization was therefore adopted. Meetings will be held once a month to talk over work done, examine such baskets as may be collected for the purpose of exhibition, and to receive suggestions and advice from the master-craftsman. The guild is planning to issue printed directions for the use of its members. These will be illustrated with line cuts, and some of these cuts will be filled in with water colors.

A large proportion of the members of the guild are teachers in the public schools in Peoria, and several of them have already begun the basket-making with their children. In some of the schools a large number of reed baskets were made by the children for Christmas presents, the children paying for the materials.

AT least three of the grammar-school principals of the city wish to introduce woodworking for the boys of the higher grades. Superintendent N. C. Daugherty is in favor of the plan, and has asked the board of education to allow the work to be begun in one or two schools, but up to the present writing no favorable action has been taken. One of the principals, Mr. W. N. Brown, of the Sumner School, feels so strongly the need of manual training for his older boys that he is organizing a Saturday manual-training club among his older boys. He will give all the instruction himself, and assume most of the financial responsibility, trusting to the sale of such things as the boys are able to make to reimburse him. Such faith and such works ought to stir the most conservative.

PROMOTERS of domestic science in the public schools throughout the state are feeling very keenly the loss of Mrs. Nellie S. Kedsie, who a few months ago resigned her position as head of the department of domestic economy at Bradley Polytechnic Institute to become the wife of Professor Jones, of Berea College. Mrs. Kedsie had been at Bradley Institute from its opening, and had always been a strong member of its faculty. In Peoria she has been very popular, and has left a host of personal friends. Her unusual power as a public speaker has made her a great attraction at educational meetings, women's clubs, and farmers' institutes, and has won for her a reputation which extends far beyond the limits of Illinois. In Missouri, Indiana, Wisconsin, and Canada her addresses have been received with enthusiasm. Last year she gave a most successful course of Saturday lectures at Purdue University. It is hoped that she can be persuaded to continue some of her work upon the lecture platform, for there seems to be no one able to fill her place in this kind of work.

At Bradley Institute the position left by Mrs. Kedsie has not been filled, though the work of the department goes on unbroken under the direction of her two chief assistants, Mrs. Elida E. Winchip in sewing and dressmaking, and Miss Bertha J. Spohr in cooking, food study, and sanitary science. Mrs. Winchip is an expert dressmaker, and was for several years superintendent of the sewing department at the Kansas Agricultural College. Miss Spohr has given particular attention to the application of scientific knowledge in the home, and is strengthening the scientific side of the work organized by Mrs. Kedsie.

EDITORIAL.

MANUAL training for the grammar-school period has suffered much on account of lack of unity and definiteness of aim. The mists of uncertainty seem never to have lifted sufficiently to allow of clear vision over the entire period at once. This has resulted too often in the work becoming a compromise between that above and that below. The grammar-school work has often been a further development of something suited to the kindergarten period or has anticipated the work of the high school. Until recently it would seem that there has been but little appreciation of the real function of grammar-school work in manual training as distinct from that of other periods, and even now many—perhaps most—grammar-school classes in manual training are in the hands of teachers whose point of view is that of the high-school or technical-school teachers. When such is the case, the best results in grammar-school work are not attainable.

During the past few years professionally trained teachers have come into the field of grammar-school work in manual training, and their clearer vision has begun to penetrate the mists of uncertainty. They are seeing more clearly what should be the function of the manual-training work of the grammar-school period, and as they see more clearly they are shaping their courses accordingly. The article by Mr. A. W. Richards in this number is an illustration of this fact.

We have suggested that clearer vision with reference to manual training in grammar schools is coming about through the efforts of these professionally trained teachers, but they are not the primary source of this change. They have received suggestions and inspiration from the psychologists and child-study specialists. On this account we have come to look with keen interest upon such articles as the one on "The Ideal School as Based on Child Study," by President G. Stanley Hall, in the September number of *The Forum*.[1] This article deals with all the subjects of the elementary school, and therefore gives but little space to manual training; but what is said with reference to manual training is particularly suggestive to grammar-school teachers.

[1] Dr. Hall's article is the paper he read before the National Council in Detroit last July. It is printed in *Addresses and Proceedings of the National Educational Association*, 1901.

Dr. Hall divides the school life of the child into four periods: (1) the kindergarten age, from two or three to six or seven; (2) the transition period when the child is seven or eight years of age; (3) the juvenile period, from eight or nine to thirteen or fourteen; (4) the adolescent period, beginning at thirteen or fourteen and lasting for about ten years. Upon the importance of the juvenile period he lays particular stress. This period, which is the grammar-school period, he says "constitutes a unique stage of life marked off by many important differences from the period which precedes and that which follows it." Among the characteristics of this period Dr. Hall points to a decrease in rate of growth and an increase of vitality, activity, and power to resist disease. He tells us that "child nature suggests very plainly that this period should be mainly devoted to drill, habituation, and mechanism. The age of reason is only dawning, and is not yet much in order; but discipline should be the watchword here." "Now writing and reading should first be taught with stress." Not until this period is it safe to tax the smaller muscles required in writing. Now the dangers attending accurate work in writing are past, but "children have no right to write unless it is upon some subject upon which they feel strongly." "Manual training and games should be extremely diverse, manifold, and thorough. It is the time to break in the human colt, which is by nature in some sense the wildest of all wild animals. If the piano or any other musical instrument is to be learned, this is the time for drill, especially on scales and exercises." "The hand is in a sense never so near the brain as now; knowledge never so strongly tends to become practical; muscular development never so conditions mental. Muscle-training of every kind, from play up to manual work, must now begin. Instead of the Swedish or other curriculized and exactly finished objects made, we should have a curriculum of toys at first and of rude scientific apparatus later, where everything will focus more upon the ulterior use of the object than upon the process of making it. All these things will be chosen from the field of the child's interests." With reference to these interests, it is further pointed out that the interests of children at this stage are almost exclusively in each other and in each other's ways, not in adults. Dr. Hall begins his summary by saying: "In fine, this is the age for training, with plenty of space and time, however, for spontaneity and voluntary action. The good teacher is a true *pedotrieb*, or boy-driver. He needs some method, but much more matter." In speaking of what the ideal child, ideally trained, should be able to do at the end of this period, he says:

"This child will be able to play several dozen games; will know something of a number of industries; and will be able to make several dozen things that he is interested in."

Here, certainly, is food for thought and an aim tersely, if not definitely, stated. The carrying out of such a program by one not trained in handicraft might be fraught with danger, as it is possible to encourage the formation of bad habits as well as good ones through the use of tools, thus missing opportunity for training and discipline which Dr. Hall says belongs particularly to this period; but it would be a grand thing for manual training in the grammar schools if our technically trained experts—sloyders and joint-makers—were to turn aside from their idols long enough to catch the meaning and spirit of such a program. Then under their direction we might see developed manual training which would meet Dr. Hall's requirements—"extremely diverse, manifold, and thorough."

What Dr. Hall says about children of the juvenile period being interested in each other and each other's ways, and what Mr. Kenyon says in his article about children imitating each other, recalls an incident that occurred in our own neighborhood a little more than a year ago:

It was midsummer. The days were very warm, but along our shady street could be heard the voices of children at play. The evenings were cool and quiet except for the occasional passing of the trolley car but half a block away. The children went to bed before the street lights were turned on. If, perchance, one lingered after the great arc light at the corner began to cast shadow-trees across the sidewalk, his voice became softened, as if by some mysterious influence, and soon was heard no more for the night.

But the serenity of our evenings was suddenly broken into by these same children. Our next-door neighbor's boy, a quiet lovable little fellow, conceived the idea of making a trolley car out of a pasteboard shoe box. Holes were cut in the ends for doors and in the sides for windows which were covered inside with red tissue paper. A short candle placed inside the box furnished illumination. The trolley was the string by which the box was drawn. News of this wonderful production spread during the afternoon, and the announcement that it was to be tested as soon as it was dark enough that evening set all the children in the block to teasing their mothers to allow them to sit up to see Ralph's new electric car on its trial trip. The performance of the car was highly satisfactory; in fact, enthusiasm ran high. The next day all the houses in the block were ransacked for shoe boxes, and the following night several cars were doing service. Ralph's sister improved upon his design, making a car with a platform and seats inside, while one boy, too small to make a car himself, tortured his papa until a real wooden car, made out

of a starch box placed upside down on a board, had been brought into service. Processions were held each evening, and every day brought forth new invention. Various devices for convenience and comfort were added. The effect of a star-shaped hole over the candle in one car seemed to suggest an unconventional treatment of window spaces, and forthwith cars appeared with circular, triangular, star-shaped, moon-shaped, diamond-shaped, and eliptical windows arranged to suit the tastes of the designers. Soon the cars began to be decorated with perforations of various symbolic forms, and the variety and attractiveness were increased by the use of different-colored papers. By this time it was not merely the children in our block who were interested in these queer processions, but everybody for several blocks around went out to the sidewalk as the nightly train went past; indeed, many would follow along, joining heartily in the merriment. The climax was reached when on a certain evening one of the larger boys appeared with an elaborate transparency placed on a pole and carried above his head. From this point on interest flagged and the art declined. It was no longer trolley-car art. Whether this boy's transparency broke the charm or not we do not know, but of this we are sure, that a few evenings afterward our street was as quiet and serene as ever, and the revival of the trolley-car art has not yet appeared.

Thus we saw the origin, development, spread, and decline of a constructive art among the children of our neighborhood: interest in a local manifestation of force, movement, and power; invention, adaptation of means at hand, modification, and improvement; decoration, the æsthetic idea predominating; loss of original constructive motive, rapid decline — a thousand years of human progress epitomized in two weeks of spontaneous activity among the children. But this never could have been acted out before us in this way, had there not been in the children susceptibility to the influences in their immediate surroundings and a strong desire to imitate each other's doings, tempered with a delightful play of individuality.

EVER since the magazine started we have felt the need of someone to review foreign books and periodicals and to keep our readers in touch with current European thought on manual training. We, therefore, take particular pleasure in announcing that Mr. J. H. Trybom, supervisor of manual training, Detroit, Mich., has consented to do this. His first contribution appears in this number. His peculiar fitness for this work is evident from the fact that he knows three languages besides English, and has studied manual training in several of the most celebrated training schools of the world. Mr. Trybom was graduated from the Swedish gymnasium at eighteen years of age, and left for this country the same year. He completed all the courses

given at the Sloyd Training School in Boston, graduating in 1891. In 1896 he received the A.B. degree at Harvard University. He returned to Harvard a year later and was a graduate student during the years 1897–98 and 1898–99. In his graduate work he gave especial attention to psychology, pedagogy, economics, and allied subjects. In 1898 he also completed three courses in the shops of the Massachusetts Institute of Technology. The year 1897 he spent abroad. While there he completed two full courses at the Leipzig Lehrerbildungsanstalt für Knabenhandarbeit. He also visited manual-training schools in operation in the principal cities in England, France, Germany, and the Scandinavian countries. Mr. Trybom has been a successful teacher in Boston, where he developed the course in manual training which is published in his book on *Cardboard Construction*. It will, therefore, be seen that our foreign reviews will be written by one who has the point of view of a student of pedagogy and a teacher and supervisor familiar with the details of the leading manual-training courses in this and foreign countries.

The demand for competent teachers of manual training is so much greater than the supply that the condition is most perplexing in small cities and towns wishing to introduce the subject. Even the large cities are finding it difficult to obtain the kind of teachers they need. During the past year we have been asked to recommend teachers for more than four times as many positions as we have known of competent men wanting such positions. Moreover, the demand did not cease with the opening of the school year, but continued through the months of September and October. Something ought to be done to call the attention of more promising young men to the opportunities in this department of teaching, and to encourage them to pursue courses of professional training which will fit them to take the good positions that are opening. The condition is such at the present time that incompetent persons are occupying positions of importance because competent ones are not to be found. This ought not to be so.

REVIEWS.

FOREIGN REVIEWS.

The inquiry into manual training in the schools of Europe may be of interest to American teachers for two reasons: (1) it may throw light upon special features of manual training emphasized in the different countries; (2) it may help us avoid trying experiments which have already proved failures abroad.

It is a truism to say that manual training, its methods and courses of study, must be adapted to the conditions existing in each particular country — I might say city — to insure its success. In so far as these conditions differ, uniformity in these respects would not be ideal. On account of peculiar local conditions more emphasis is naturally placed upon certain features than upon others. It is this fact that will make a comparative study of systems of manual training in different countries of interest to the readers of this magazine. In one country, for instance, particular emphasis may have been placed upon the correlation of manual training with other studies; in another the technical difficulties may have received special attention; and, again, in another the theoretical phase of our subject may have been carefully studied. This is exactly what has taken place in the three principal countries of Europe during the past twenty years.

France, with its extremely centralized system of education, has paid more attention than any other country to the correlation of manual training with the other studies. As we shall see later, this correlation has not always been to the advantage of manual training; nevertheless, we may by examining the methods in vogue in Paris, for instance, get several valuable suggestions for making manual training an intregal part of the curriculum, and this is for us American teachers a most important problem, as we all realize.

In England, again, different conditions have brought other issues to the forefront. Very little has been done in the line of correlation, but, on the other hand, the technical aspects of our subject have there received special attention. When manual training was first recommended by the government, the supervision of this branch of instruction was given to the science and art department, and not to the department of education. The grants to the manual-training schools were made dependent upon examinations passed by the pupils in the use of tools. I happened to visit the schools in Manchester at a time when a government inspector was there examining the pupils in the manual-training classes. He had them make a simple joint and gave them some questions on the construction and use of the tools. For each pupil that passed this examination the school board of Manchester received a certain sum from the government. Thus skill became the primary object of the instructors, and consequently their greatest efforts were directed toward the systematic arrangement of the tool exercises and in devising methods of teaching with this end in view. As each city has its independent director of manual training, we find in England today a great number and variety of courses of study in bench-work, admirably adapted, I believe, to give the students technical skill in the use of tools. Most of the directors in the

larger cities have published their courses of study in beautifully illustrated volumes; on the other hand, I have yet to find a single book written in England presenting the theoretical aspects of manual training.

In Germany the conditions have been such as to produce the opposite results. The practical phase of the subject as regards courses of study and methods of teaching has not been developed, for the simple reason that manual training is not a regular part of the curriculum; but, on the other hand, there are more books and pamphlets written in Germany presenting the theory of manual training than in all other countries taken together. When we may write a paper on such a subject as the "Hygiene of Manual Training," for instance, the Germans will write a book, and, if I mistake not, there have been published in that country within the last few years three books dealing with this same theme.

This short review only suggests the special features that may be of interest to us in the countries mentioned. In whatever field their efforts have been made, there we are sure to learn something that may help us in solving our difficulties or keep us from making mistakes.

DEMOLIN'S "ANGLO-SAXON SUPERIORITY."

There was a book published in Paris three years ago that every manual-training teacher should read. At times when the returns for hard work seem to be rather discouraging — and I dare say some of us have had that experience — I would recommend as an antidote Demolin's book on *Anglo-Saxon Superiority: To What it is Due.* I recommend the book not merely so we may gather new courage, and certainly not that this exposition of American and English supremacy shall encourage complacency; but rather as it affords an opportunity to study the underlying causes of this supremacy, particularly from the educational point of view. Individual self-reliance, he claims, is the chief source of this superiority. He gives interesting illustrations of the way in which this particular power is developed in the schools and homes of England and this country. He pays particular attention to manual occupations in school and to what they should accomplish, thus pointing out the social significance of our subject.

In a most interesting chapter on "What Social State is Most Conducive to Happiness?" he comes to the conclusion that "fitness for work" is the basis of happiness. With us in the schoolroom the atmosphere of interest is tantamount to happiness. A vital form of interest springs from capacity for a fitness to do the task in hand, or, to put it tersely, interest is based upon power. To make a very practical application: if we arrange our courses so that our pupils are able to do the constructive exercises well at each stage of their development, a continued interest will follow.

I again cordially recommend Demolin's book. The luminous treatment of the social significance of manual training makes it of special interest to manual-training teachers.

It is translated, and published by R. F. Fenno & Co., New York.

MANUAL TRAINING IN THE SCHOOLS OF PARIS.

Experimental work was begun in one of the Paris schools in 1873. In the school law of 1882 manual training was made a part of the regular curriculum in the elementary schools. Great difficulties were experienced in getting good teachers, and an additional 150 francs per year was paid to teachers who took a course and afterward taught manual training. At present 133 schools in Paris have an equipment for

woodwork, and forty-three for metal-work, besides the nine technical schools with equipments for high-school work.

The characteristic feature of all the manual training in the Parisian schools is the close correlation between manual training, drawing, geometry, and some of the other subjects. Every model is drawn on paper before it is constructed in the workrooms, and there is no exception to this rule. This preparatory work is done in the class-room. Each pupil has a special notebook, and the study of the object to be made is taken up under four heads: (1) a study of the object from a technical point of view, (2) the geometrical problems illustrated by the model, (3) the drawing of the object, and (4) the use of the object.

These efforts at correlation have influenced the courses of study. Among the models both in the wood- and metal-work we find the regular geometrical figures in abundance. The square, the rectangle, the equilateral triangle, etc., are made even by the classes in metal-work.

J. H. TRYBOM.

BOOKS.

Paper and Cardboard Work. By Arthur Henry Chamberlain. The Whitaker & Ray Co., San Francisco. 6 × 8 in.; pp. 113; price, $0.75.—A suggestive course of forty models of useful articles, designed for use in the third and fourth grades. The first twenty models are each cut from one piece of paper, and, where fastening is needed, holes are punched and cord or ribbon is used. The curve is introduced in the sixth model and used frequently. The second half of the book uses paste for fastening, and most of the models are made from a single piece of paper.

The psychological basis of the work is given and the limits of the course defined The course is a suggested one and not a fixed set of models. The drawings in the book are well executed.

While manual-training teachers will not find anything radically new in paper construction in this book, the designs are excellent and the psychological sequence the result of much care. The variety of the constructions is not as good as the variety of designs. We cannot help but wish that the excellent work of the designer might have been carried farther and the decoration upon the models suggested. As the greatest need for such a book is among the teachers in small places, and among teachers untrained in manual expression, it would have made the book even more complete, had the construction of the drawing been entered into more fully. The above statements only express the wish that the excellent work in the book might have been extended to the other problems so closely related to the field covered. The book is an improvement over any previous one on the subject of paper construction.

F. H. IRONS.

Architecture—Vol. I of "Outlines of Art History." By James Frederick Hopkins. Published by the Educational Publishing Co., Boston. 8 × 5½ in.; pp. 242.—This book, accompanied by the announcement of the two which are in preparation—one on sculpture and ornament and the other on painting—will be warmly welcomed by the many teachers who have felt the need of some non-technical publication which will lead them to a better understanding of the great styles of architecture and ornament, and the celebrated schools of painting.

The present book in ten brief chapters gives an outline of architectural development from its early manifestations in the valley of the Nile 2,000 years B. C. down

through the work of the master-builders of classic Greece, of imperial Rome, and Byzantium, setting forth the picturesqueness of the Gothic cathedrals of mediæval France, the richness of the works of the Renaissance in Italy, and ending with the public libraries, homes, and business structures of our country and time. Each of the successive styles is illustrated by reproductions from photographs of recognized masterpieces. In fact, the book is copiously illustrated with half-tones and line cuts. It is printed on good paper, has convenient marginal headings, appropriate chapter initials, and in every way is a very satisfactory piece of bookmaking.

The author's style of writing is essayish rather than expository. He writes with an agreeable flow of language about things which one sometimes feels he does not sufficiently explain or bring out into clear perspective. However, this is partly due to the necessity of condensing, but he is constantly taking it for granted that the reader has a broad knowledge of history and considerable familiarity with details of architectural construction. This may not be objectionable to some readers, but as the book is intended especially for the use of the elementary-school "teacher with her boys and girls," we think that less should have been taken for granted and that fundamentals of construction should have been made clearer. We think, therefore, that he has made a mistake in assuming that practically all knowledge of constructive details should be reserved for students of college or advanced grade. We believe that the grammar-school pupil is even more likely to want to know what a given part is for, and how it functions, than is the high-school pupil. Moreover, Gothic architecture, for instance, cannot be appreciated any more without some understanding of the action of the forces at work in its highly organized framework of piers, buttresses, arches, and vaults than it can without some knowledge of the civic, social, and religious conditions which called it forth. And we believe that the former should be clearly and forcefully presented along with the latter. The action of forces at work in the material structure may be studied along with the action of forces in the social structure. Great architecture is the resultant of both.

We are glad to welcome the book. It is very helpful at this time. Only in these respects would we wish it fundamentally different.

PERIODICALS.

An unusually large number of new periodicals have appeared during the past few months. From England comes the *Manual Training Teacher*, the organ of the National Association of Manual Training Teachers. This modest-appearing monthly began with the August number. It is edited by Mr. Evan Ortner, demonstrator at the Royal Military Academy at Woolrich. We are glad to welcome this journal, and wish it success.

The Canadian Housekeeper, a few months older, has been giving considerable space to manual training for boys, and has published several half-tones illustrating courses pursued in Canadian schools.

The Craftsman is a unique publication coming from the United Crafts at Eastwood, New York. It is printed in type that suggests the "Golden" type designed by William Morris for the Kelmscott Press, but is easier to read. It is published monthly. Its purpose is the betterment of household art. Each of the three numbers thus far published has been a monograph, the first on William Morris, the second on John Ruskin, and the third on the "Gilds of the Middle Ages." Each contains a few

excellent half-tone illustrations of examples of that epoch-making furniture which is being made at Eastwood.

Another unique periodical that bids fair to have great influence is *The Applied Arts Book*, "the voice of the Applied Arts Guild, Worcester, Mass." The guild is "a company of supervisors and teachers of drawing and allied topics in the public schools of America." As stated in the first issue of the book, it "aims to promote by every legitimate means the progress of sound art instruction and the development of public taste in all matters relating to the applied arts. It stands for beauty in American life." *The Applied Arts Book* is "prepared under the eye of Fred Hamilton Daniels, guildmaster, in consultation with Henry Turner Bailey, state agent for the promotion of industrial drawing, Massachusetts, and James Hall, supervisor of drawing, Springfield, Massachusetts." It is published monthly, and each number contains an approved outline of drawing work for the month for all the grades of the elementary schools. Among the articles that have already appeared are several on lettering, color, constructive and decorative design, composition, and the drawing of flowers. A feature of the publication is the large number of initials, tail pieces, and small sketchy illustrations reproduced from pen drawings.

Art Study appeared first in November. This is edited by Georgia Fraser Arkell, and published by J. C. Witter, of New York. Its aim, evidently, is to take the place of *Art Education*. Its half-tone illustrations have the same excellent quality, though the magazine is much smaller and less expensive.

We have received several copies of *Young America*, edited by Ossian H. Lang, of New York, which contains helpful suggestions for boys and girls interested in making things. One department of the paper is headed "Things to Make." In one number we find directions for making a toy steamer; in another, a water telescope.

The following have been received:

Elementary Course in Woodwork. By George Alexander Ross. A. Flanagan Co., Chicago. $8 \times 5\frac{1}{2}$ in.; pp. 117. Designed for use in high and technical schools.

The Cost of Food. By Ellen H. Richards. John Wiley & Sons, New York. $7\frac{1}{2} \times 5$ in.; pp. 161; price, $1.

Light, Heat and Power in Buildings. By Alton D. Adams. William T. Comstock, New York. $7\frac{1}{2} \times 5$ in.; pp. 102; price, $1.

Report of Examinations Department of the City and Guilds of London Institute. Whittaker & Co., London, England. $8\frac{1}{2} \times 5\frac{1}{2}$ in.; pp. 306; price, 1s.

Sweet Potatoes. By D. M. Nesbit. "Farmer's Bulletin" No. 129, issued by the U. S. Department of Agriculture, Washington, D. C.

Manual Training for Boys. An eleven-page pamphlet containing drawings and descriptive matter concerning nineteen models (exercise pieces and useful articles) constituting the course of instruction in woodwork for the seventh and eighth grades of the St. Louis public schools.

Addresses and Proceedings of the National Educational Association, 1901. Irwin Shepard, secretary, Winona, Minn. Contains papers read at Detroit convention and a stenographic report of the discussion which followed Principal Charles F. Warner's paper on "Education for the Trades in America — What Can Technical High Schools Do for It?" This volume also contains the papers on manual training read before the Department of Superintendence in Chicago last February.

Report of the Commissioner of Education, 1899–1900, Vol. I. By Dr. William T. Harris. Bureau of Education, Washington, D. C.

MANUAL TRAINING MAGAZINE

APRIL, 1902

MANUAL TRAINING IN PUBLIC SCHOOLS.[1]

CHARLES B. GILBERT,
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ALLOW me to say at the outset that I do not regard manual training as a patent medicine or even a duly authorized prescription for the cure of human ills. While I am a friend of manual training, I trust that I am not, to this degree at least, a foolish friend. On the other hand, I do not regard manual training as a subject for the few, the poor, the toilers with their hands, alone. It is a legitimate, proper, and necessary branch of modern education alike appropriate to all, and as such it should be placed in the curriculum of our public schools of all grades. This position I will endeavor to maintain, not because I expect it to be controverted, but because I believe it can be maintained upon other grounds than those usually advanced. As preliminary to my argument. I desire to state plainly a few postulates.

First, there is no limit to the amount of education that the state should offer to its children, unless it be minute specialization, which is not properly education at all. The state not only may, but must, train her future citizens by every means that will make them valuable to her.

Second, education is not a fixed, but is a variable term. What would be complete education today, ten years hence might not be. We cannot base the education of any single generation upon what has been found satisfactory in the past, except to a very limited degree, because all education, and especially that required by a free state for its own perpetuity, involves the consideration of two distinct elements: the being to be educated and the civilization in which he is destined to be a factor. Fitting the child to be a definite, efficient, and beneficent force in society is the end of education by the state. This involves

[1] Read before the Eastern Manual Training Association, June 29, 1901.

the training of all his powers. It also involves the cultivation of a sympathetic comprehension of the needs and conditions of society. This point has been clearly made by Dr. Harris in the report of the Committee of Fifteen.

Such appreciation does not come through the mere receiving of information; what we ordinarily call knowledge, especially knowledge about things as distinguished from knowledge of things, does not necessarily fit the possessor for successful or useful living. That comes only through experience, by which we mean living a life similar in conditions to that for which the preparation is sought. Hence a school should be a microcosm, and the child in school should lead a life which is a miniature of the larger life in the world. This doctrine has been much exploited of late, but will bear it.

A fundamental error of the old elementary education is its insistence that the child is fitted for life when he has been told a few things about life, and has received an explanation of a few of the tools that real people use in real living. This is not education at all. It is, at best, knowledge of an inferior sort.

The superiority of the kindergarten over the ordinary primary school does not consist in the character of the tools used—the gifts, the occupations, the circle upon the floor—but in the fact that it is an institution of which the child is an integral part. He is, while in the kindergarten, living a life to him as real as the life which his father lives, or you, or I. He is a member of a community in which all have a part and which goes through seriously the regular businesses, amusements, and duties of a life which is but a miniature of the life of the great world, and by this actual living he is fitted to be a potent factor in society. The child is entitled to a real daily life, and he whose life is spent solely in abstract contemplation of the past, or in abstract study of arts that men use in life, without direct contact with such life, is robbed of his right, while society is robbed of a trained citizen. This vital connection between the processes of education and the civilization into which the child is growing is the aim of true education.

May I be allowed to digress? This thought that preparation is one thing and realization another did not belong solely to the old education. It was inwrought into the life of the past. It belonged especially to theology, from which it spread to other departments of life.

"This world is but a fleeting show,
For man's illusion given.
Its smiles of joy, its tears of woe,
Deceitful shine, deceitful flow:
There's nothing true but heaven,"

is its keynote. All was a preparation for the future, to such an extent that nothing was real. In some mysterious way the soul was supposed to be fitted for future life, not by the abundance of present life, but by its negation. It is easy to trace the connection between this theology and the old education of the three R's.

All study was a study about things through words. The other arts by which man expresses himself did not enter into the general education; they were reserved for real life. Now there are many arts which man uses to express himself, and to many people these arts are the natural and proper expression of the best that is in them, and stand for higher ideals and for more effective service to mankind than words could possibly represent. The painter's brush and palette, the sculptor's chisel, the carpenter's hammer, and the seamstress's needle often stand for more true service to civilization, nobler sacrifices for the common good, higher ideals, than many a sermon, poem, and philosophical treatise. Indeed, words are useful but as they lead to deeds. They are at best intermediary, and I am not sure but that I envy those men who have been able to put their lofty conceptions into solid stone. I deem this point worth repetition. The man who puts his dream, his inspiration, his ideals into a painting, a statue, a temple, serves man as effectuallv, and in as high and idealistic a sense, as he who puts his into the form of a poem or proverb.

Nay more; the man who puts his ideal into solid, useful form, though not æsthetic — he who makes a tool for man to labor with, a machine to lessen human toil, an engine to annihilate space and bring two worlds together; yes, a garment to clothe the naked, a bucket to draw water from the well for the thirsty — is as truly serving civilization and may be as genuine an idealist as the author of an epic or the builder of a church; hence education, if it is to fit the child to have sympathy with the present civilization, to lead him to comprehend the motives that have caused it, to fill him with desires for service to mankind, to give him ability to fit himself to become an effective force in civilization, cannot ignore these other arts.

The greatest force in the civilization of the present generation has been manifested through the so-called mechanical arts. This is the

same force that has manifested itself at different times in history—in the verses of Homer, in the prophecies of Isaiah, in the pyramids of Egypt, in the glories of the Acropolis, in the *Divina Commedia*, in *King Lear*, in *Paradise Lost*, and in *In Memoriam*. It is the divine spirit speaking through the works of man; in other words, it is inspiration.

> "The old order changeth, yielding place to new,
> And God fulfills himself in many ways,
> Lest one good custom should corrupt the world."

Change does not mean decay. We hear lamentations continually because of the decline of poetry; we hear the complaint that pure literature is no longer produced. What of it? Does it mean there are no longer lofty ideals; that men do not have high thoughts, dream noble dreams? By no means. These Jeremiads simply show a failure to comprehend the manifold workings of the divine spirit. Men say that this is a materialistic age, and denounce it. Such denunciation is the cheap and silly talk of superficial critics who like to make high-sounding generalizations. It is true that there is much of luxury in this age; that has been true of every age. It is true that men seek material goods; men always have. But it is not true that matter rules. It is true that men have higher ideals than ever before, that there is more of the spirit of service in the world today than in the days of the past.

The wonderful progress in the realms of science and of mechanical construction has simply made it possible for higher ideals to become common property. The increased material comfort of the average home renders it possible for the occupants of that home to devote more time and energy to higher things — to art, to literature, to religion and philanthropy — than was ever possible before. The present age stands, not for the triumph of matter over spirit, but for the triumph of spirit over matter. It appears to be a materialistic age because men are using matter for spiritual ends. The building of homes may be a more truly spiritual end than the building of churches. This is a fact long ago realized by missionaries. So, when we contend that the education of children should not consist in the mere conning of words, but should seek to put them into sympathetic relation with all good forces and all good things, we are not serving Mammon, or bowing down before a materialistic altar, but are helping along the progress of the world by teaching that larger conception of the utility of all things good, and by showing the child how to use every force for service.

It is time that thoughtful people protested against the assumption on the part of certain classes that their work is essentially higher than that of others. All work is high that is not purely selfish or injurious to society. The exalted character of a man's work is to be measured by the degree of its usefulness to mankind. I believe in the universality of service.

First, then, manual training in public schools is necessary to a thorough and sympathetic understanding of our civilization. This cannot be obtained by mere reading about those material triumphs which are the distinguishing mark of the age. This is a generally accepted pedagogic principle which does not need to be enlarged upon here. All modern, elementary teaching which can in any sense be termed scientific employs it. We teach language by its use. The child who tries to use language well to express his best thought is better able to comprehend the successes of others in literature. So the boy who has hammered and chiseled and sawed to produce something of beauty or some object of utility out of unyielding material is in a position to understand mechanical triumphs. The boy who has conceived, drawn, and constructed a machine understands the value of machinery in this its age.

Second, manual training in public schools has a most marked tendency toward the breaking down of lines of class and the creation of true democracy. The majority of men are engaged in some form of manual labor. Sometimes this labor requires great mental power; sometimes not. The boy who has worked at the bench, his elbow touching that of another boy of totally different home environment and training, is more likely to appreciate the value of honest effort in any line and to understand that service is not limited to any particular class.

The great questions that trouble us today and seem to be growing in importance and difficulty — the questions of the difference between so-called labor and capital, between those who labor with their hands and those who perform other kinds of labor — will not be solved by legislation. They are moral questions, and will not be settled until men sympathize with men regardless of class, and recognize the good in one another; until the misunderstandings which are at the bottom of nearly all quarrels disappear before the clear dawn of sympathy; and I believe that the general introduction of manual training into the people's schools will have a strong tendency to produce this sympathy.

Third, manual training gives the child a chance to know himself. The more numerous and various the ways by which the child tests himself and trains himself during the period of his elementary education, the more likely he is to know in which field he can best serve his generation. The choice of an occupation, a definite means for common service, too frequently rests upon chance. The average boy and girl, looking for work, takes what comes first and bids fair to offer a living, the tendency being, among thinking people where election is possible, to choose occupations not likely to interfere with white hands. The cases of round pegs in square holes are innumerable.

Many and many a boy with vigorous frame, accurate eye, and good muscles who might accomplish great things if he had been trained to put his thoughts into material form, wears out his life selling ribbons by the yard or making trial balances (drudgery of drudgeries), simply because he has a fancy for clean occupations that let him wear his best clothes every day and has never felt that ennobling enthusiasm for the making of things, the actual production of articles, which a course in manual training would have given him ; hence the introduction of manual training into public schools enables a vastly larger number of children to find themselves and choose for themselves the right places for life-work.

This alone will effect immense economies and very greatly hasten the progress of civilization. If every educated boy and girl who labors — that is, who contributes to the general good — were to work along the line of his own interest and ability, think what a vast saving of energy would be effected; for the greatest waste in the world comes, not from idleness, but from misdirected energy, and the failures in life are very largely due to the fact that people have not found their proper places.

We need at the present time the reunion of mind and muscle, not trained hands merely, but trained minds with hands subject to them. The trained hand is nothing but a machine, and it is that that the skilful average journeyman mechanic has. Among no class of people are thoroughly trained minds needed more than among those who represent material development, the so-called laboring classes (as if forsooth we did not all labor). The great problems of the day affect directly these classes and must be settled by them.

There is no better field in which a trained mind can serve humanity than in the ranks of skilled labor. The opportunity for leadership of the highest sort, for the exercise of those qualities which constitute

statesmanship, has been transferred from the halls of legislation to the halls of the labor union. If mechanics are to be merely trained muscles, mechanical automata, we may well dread to face the future. Trained leaders, wise and philanthropic, must be raised. It is a field for the noblest ambition.

If Mr. Debs, or Mr. Powderly, or any of the other so-called labor leaders, had been wise men, unselfish men, good men, they could have done more to advance the cause of civilization than any man who has been in public life during the last twenty five years. The labor union has taken the place of the town meeting. Politics have become machinery where free discussion exists no longer. The school for citizens has been transferred, for the majority at least, to those halls where men with common interests, vital to themselves, meet and discuss them; hence our schools must educate boys and girls in sympathy with human toil and bring trained minds to bear upon these great problems from the laborers' side.

If by courses of manual training taste can be directed to this department of human effort, and large numbers of our best-trained young citizens can be led into these fields of labor for life, the leavening power will be tremendous, and the freshly imported foreigner, trained under other systems, will cease to be the ruling force in American social struggles.

There is another purely educational effect of manual training which must be treated. The highest activity of the mind is creation, the conceiving a new thing and carefully working out in detail the conception, and then putting it into actual realization. The man who conceives, designs, and makes things is performing the highest function of mind. This is what is done in a proper course of manual training. The imagination is stimulated, expression is encouraged, and then production follows and completes the educational circle. The boy who has thought out a tool, or a machine, or even a definite piece of carpentry, has portrayed his conception in a drawing upon paper, and then has made it, has really accomplished more and has gotten more power than would have been possible through any amount of learning about things.

I called it an educational circle. Perhaps spiral would be better, because it is never complete. A conception originates in the imagination; it is followed out into design; and the first round is completed when the solid product stands before its creator finished; but this product and the labor put forth in its creation stimulate the imagination

anew and arouse new conceptions leading to new designs and new productions. Creation is born from creation, and this is just as true with these material things as in the realms of pure intellect, and for the average boy and girl it is more real and hence more true. Making things, not after a design first made by someone else, but as they have grown out of the soul of the maker, is creation; and the world advances by the creations of men, not by their imitations, whether those creations be ideas embodied in words, ideals embodied in acts, or conceptions embodied in things.

The advantage of manual-training work for young people is its reality. It is so tangible. The boy has ideas, but words for their expression escape him; he is frequently embarrassed and unable to express himself in acts; but give him tools and things to work on, and he possesses himself at once, and through the exercise of this highest function gains that tremendous power that comes in no other way. It gives him new interest. We all know how difficult it is to keep boys and girls in school at a certain age. The enthusiasm of discovery which belongs to infancy and has carried them through the primary years is gone. For the period of adolescence, with its new hopes and ambitions, making over the nature of the youth, the ordinary school exercises offer little. Hence it is the period of truancy and bad associations when the boy is a puzzle, and we wonder if he will ever come out right. Acquisition is not so active a mental trait then as a little earlier in life. Creation is becoming dominant; the boy is intensely practical; his ideals must take a definite, clear, tangible form, or they are less than moonshine. At this age, the box of tools at home, the manual-training shop at school, supply the needed stimulus and interest, to the great relief of anxious parent and teacher. We are put into this material world for something besides its crucifixion. Animal nature was given its prominence for something other than its crucifixion. The child, like any other animal, must investigate his material surroundings and be able to master them. This is the first mastery in the young life, and, if properly directed, becomes the key to all the greater and wiser and wider masteries of the future. Manual training aids and encourages this mastery of mind over matter. Anyone who has felt the thrill when the object of his dream, even if it be a humble box, stands before him complete, perfect, visible, tangible, will know the power of manual training to create and hold interest.

My belief, then, is that manual training in some form should be a

part of every public-school course, from the kindergarten through the high school, at least.

I leave it to experts to suggest the details of such a course of study. Suffice it to say that, if a good manual-training course be pursued throughout the years of the elementary school, two ends will be accomplished: the child who enters the high school will have received the advantage of broader training, and he will have discovered, to a degree at least, his own tastes and abilities.

Why should he here, at the most critical time of his life, be suddenly deprived of all these advantages, unless he has become so enamored of manual training that he elects to make it the central study of his curriculum? The educational effect of a limited pursuit of this broadening exercise is surely as valuable here as in the grammar school.

It can easily be shown that to the adolescent boy and girl manual training offers peculiar advantages. I am not sure but, if I had to choose between giving it to all children in elementary schools and giving it to the same in secondary schools, I should choose the latter. This is the time of unrest; the time when ideals are forming, when aptitudes are discovering themselves, when tastes are developing, and the choosing of a life-work is a near and real necessity.

It is a time, too, when the interest furnished by the realities of manual training is often needed to keep the boy and girl in school, and also to keep them from unwise notions and evil habits.

It is clear that, if we are to justify manual training in public schools on educational and social grounds, the high school is the place of places where it belongs.

This is clearly an argument for manual training as a co-ordinate branch in all high schools, as against the segregation of those electing to make it the major branch in separate manual-training high schools. Comparatively few are ready on entering high school to elect a determining course, particularly one as yet opposed to high-school traditions. So that even in large cities one manual-training high school is usually enough, even where there are several other high schools. Hence all the students in these other schools are deprived of the benefits of this training, to their detriment, if the training is of real benefit, as we believe.

I contend that a manual-training equipment should be as much a part of a high-school plant as a laboratory for physics or chemistry; that it should be open to all students of both sexes; that varied courses should be offered so that students in any department, even

the college preparatory, may have some of this work. I would have full manual-training courses, equal to those in the best manual-training high schools, for those desiring such, and more limited courses for those desiring to pursue them in connection with other work.

There is a double advantage in such an arrangement: the students taking full manual-training courses have at the least cost the advantage of the other cultural studies, and those taking full courses in these studies have the advantage of manual training.

It is most important that manual-training students have complete courses in the humanities also. This is easily accomplished. The manual-training work furnishes so much of rest and change that the mind is able easily to master the other courses.

I desire modestly to mention one other reason why I consider a high school with manual-training courses better than the manual-training high school. It is the preservation of the highest ideals of manual-training work in education. The tendency of the manual-training high school is more and more toward the trade-school ideal. The purely mechanical features are likely increasingly to dominate the school. The humanizing features of the curriculum are quite sure to be regarded by students as of less importance than the mechanical and technical. In this feeling the teachers quite too readily join, with the result that the school becomes narrow and one-sided, the technical and mechanical features controlling. This is the result almost always noticeable in technical schools. Instances could be given, except that they might be deemed invidious, of schools of high standing in this country which are now rapidly undergoing this unfortunate change, so much so that the liberal arts are being discountenanced, and even the teaching of mathematics has lost its academic character, and has become merely instruction in its superficial and mechanical features.

As I said in the beginning, I do not regard manual training as a panacea for educational ills, nor would I accept the manual-training course as furnishing in itself and alone, for the average youth, a desirable education.

If we must confine ourselves to one department of mental activity, let it be the humanities. It is only when manual training fits into a general scheme, where it fulfils its own definite purpose, such as I have tried to outline in this paper, that it becomes valuable. Then, as I fully believe, it is of very great value.

That these various results may be secured I urge again, in closing,

that, in the establishment of manual training in city systems of education, it be introduced as a co-ordinate branch along with the other branches all through the course, beginning at the kindergarten and ending with the senior year at the high school, and that separate manual-training schools be not established excepting when and where it is clearly decided that the business of the state is to support trade schools — for such special manual-training schools are sure to become.

THE ORGANIZATION OF MANUAL TRAINING IN HIGH SCHOOLS.[1]

CHARLES A. BENNETT.

I.

THE questions which I am to discuss in this paper seem to cluster around, or grow out of, the familiar proposition that the chief function of the secondary school is to help pupils to discover themselves. It is not, we say, of greatest importance that the high-school graduate on commencement day shall know the contents of a certain number of books, or have power to do a certain number of specific things, but that he shall have discovered the pathway which leads to the field of activity which he is best endowed by nature to work in. He may not have observed the windings or the end of the pathway or the breadth of the field, but he should be reasonably certain as to the general direction in which it lies, and have already turned his face that way.

If this is the chief, or even one of the chief, functions of secondary education, then it follows that the high school must afford a wide range of opportunity through a variety of studies and occupations. Indeed, it must insist upon each pupil having a rich and varied course. Especially is this true for the first two years or more; otherwise, how can a pupil be sure to discover himself? How can he discover that he was meant to serve in any particular one of the great divisions of human activity until he has tried such activity, or, at least, has obtained some knowledge of its rudimentary forms?

To afford such opportunity as is here suggested, the school must have a course of study which is both broad and rich, covering not merely language and mathematics, but history, science, and industry as well. The course must not be dried up in one part and juicy in another, but juicy and tempting throughout.

One of the chief obstacles in the way of realizing the full measure of results from this great function of secondary education is the establishment of specialized high schools in our larger cities. Such action affects not only the larger cities themselves, but the smaller ones also

[1] The first part of this article was read November 8, 1901, before the fifteenth educational conference of the academies and high schools affiliating or co-operating with the University of Chicago, under the title "Current Problems in Secondary Education from the Standpoint of Manual Training."

which try to copy after them. When there has been established in a given city a Latin high school and an English high school and a manual-training high school, the resulting grouping of studies for these several schools materially narrows the opportunities of the individual pupils in each one of them. Or, if there is no narrowing because there was never greater breadth, we observe that, whereas formerly, or under other conditions, each individual was given all the opportunities the city afforded, now he has only a fraction of them. Unless it can be proven that sufficient opportunity to discover aptitude is given during the several grades of the elementary schools, and that

FIG. 1.—SPUN DISHES, DESIGNED BY STUDENTS.

the pupil is developed enough to make intelligent use of this opportunity—which would be very difficult to prove—then the plan of having specialized high schools works against the realization of the highest ideals in secondary-school work.

The question then arises: Is it not possible to organize a high school which shall bring together the opportunities of all these special schools in a single organic whole? When this question shall have been answered in the affirmative, and a satisfactory plan for such a school outlined, then we shall see more clearly the form and framework of a superior type of school. Moreover, this school will be as well suited to the needs of the small city as of the large. Then the high school in the small city can be, as formerly, the same in kind, though not in degree, as the school in the largest city.

So far as the development of separate Latin and English high schools is concerned, only a small section of the country has been affected —the extreme East; but the manual-training high school, born in the West and quickly copied in the East and encouraged by private gifts, has affected secondary-school work in large cities throughout the entire country. The popularity of these schools has been so marked

that there is not a shadow of doubt that they have met a demand which is just as real in the small city as in the large, and one which will be just as great in the next generation as in the present one. Though housed in inferior buildings, as in Philadelphia, Brooklyn, and Chicago, they have been overcrowded with students, and are daily accomplishing what was once deemed impossible, namely, giving students the benefit of a large amount of work in manual training and drawing, and at the end of four years sending them to college or to business, with superior preparation. As would be expected, there have been some misfits in individual cases, and the wisest of the principals of these schools have constantly reduced the number of such by broadening the course of instruction until, in some of these schools, the student may study Latin, and, in nearly all of them, German and French, under conditions about as favorable as in high schools of the older type. Under such conditions, the new school encroaches upon the territory of the old, and really becomes a general high school in which emphasis is placed upon manual training.

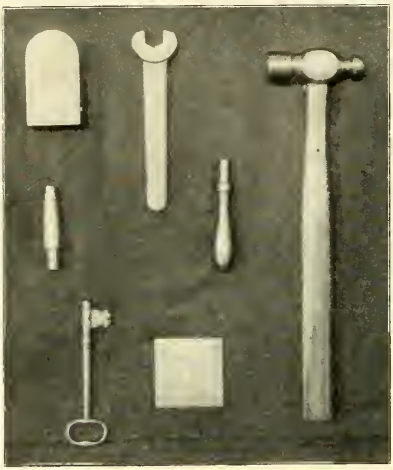


FIG. 2.—FILING, FITTING, TURNING, AND POLISHING.

Now that the great value of manual training has come to be recognized in secondary schools, why should not all pupils have the benefit of it? Since the manual-training high school has so fully demonstrated its efficiency, and, in its best form, has come to be a broad, general school with emphasis on manual training, why should not another step forward be taken by removing that emphasis, or, better, by emphasizing each of the particular lines of work to the same degree? Then, when considered from the point of view of our initial proposition, we should have a high school of a higher type than is common today. In certain manual-training high schools there seems to be a lack of proper balance of opportunity due to an overemphasis upon some of the more technical branches of manual training. This technical work would not seem to be so excessive if it were balanced by

equally specialized work in several other directions — in language, literature, applied science, and art. The danger lies not so much in offering too much in any one line as in failing to keep a proper breadth and balance of opportunity, and in neglecting to study the needs of the individual students. If, under given conditions, the manual-training high school, as it is usually constituted today, presents too large a proportion of manual training to balance other subjects, prune it down, if you cannot increase the other subjects to the same proportion.

This suggests the thought that, once having in mind this typical high school in which is combined all that is best in the Latin, the English, and the manual-training high schools, a way is open for adapting this school to cities and towns of various sizes. In doing this, we must deal with cross-sections, as it were, instead of longitudinal sections, of the courses in the typical school, reducing or enlarging to suit the size and wealth of the community. Thus the very large town or small city would have a high school which includes in its course something in each of the fundamental lines of study represented in the typical school for the large city of which we have been speaking; but none of these lines would be represented in so rich and varied a manner, except in case of some special local demand which deserved to be met. For instance, Latin might be taught, but not Greek; German, but not French; geometry, but not trigonometry; biology, but not physiography; freehand and mechanical drawing, but not architectural drawing and machine design; woodworking and metalworking, but not pattern-making and machine construction; the arts of the household, but not technical millinery or tailoring. Manual training would be given as much of a representation as the sciences. Woodworking, metalworking, the domestic arts, and drawing would balance chemistry, biology, and domestic science.

To be more specific with reference to manual training and drawing, every township high school should have a room equipped for woodworking, one for drawing, and another for household arts. Under some conditions, two rooms instead of three would be sufficient. The high school of a city of from 30,000 to 100,000 inhabitants should have a room for woodworking equipped for benchwork and woodturning; another for work in cold metals such as filing and fitting, bent iron work, hand-tool turning, and sheet-metal work, including metal-spinning; a third room, of smaller size, should be the connecting link between manual training and physics, and be supplied with a few

machine tools, a forge, and tools and apparatus for electrical construction and testing. In connection with each of these rooms there should be a stock- and tool-room and a wash-room. One large room should be provided for needlework, dressmaking, and the study of textiles, and two for drawing — freehand and mechanical. Domestic science should be classed with science studies, and as such be provided with a laboratory. Such an equipment as this, though much smaller than that of the average manual-training high school, under the direction of a teacher who sought to bring together science and construction, art and handicraft — in fact, unity in the entire school work—would yield remarkable results. A high school for a large, wealthy city like Chicago or Cleveland or Boston should contain, in addition to what has already been mentioned, rooms for forging, foundry work, machine-tool work; also extra space for drawing and art work, including the household arts, and for household science — in short, about such an equipment as is now found in the best manual-training high schools. Such a school would be of large size, and only a fraction of the students would take the maximum amount of work in manual training. It would, however, if properly balanced, be richer in opportunity than any public high school with which I am acquainted.

Coming back again to one of the thoughts already touched upon, the best results from a high school of this type, whether in magnified or miniature form, can be obtained only when every pupil is required to do a certain minimum of work in each of the fundamental lines of effort before he is allowed to choose his course or group of studies. In other words, before he is allowed to choose definitely his group of studies, he must have taken work in English, possibly one foreign language, mathematics, science, history, drawing, and manual training. Very few options should be allowed during the first two years. After the pupil has spent a reasonable length of time on each of the fundamental lines of study, he is in a far better condition to make an intelligent choice than he possibly could have been, had any one of these been omitted. There may be exceptions due to peculiar conditions, but this is the general rule. The kind of a high school, then, which I would advocate as best fitted to meet the usual conditions in secondary-school work, is not a manual-training high school, or a Latin school, or an English high school, but a broad general high school covering the fundamental lines of instruction usually given in all these various schools, and carrying each line as far as local conditions make it possible and desirable, but always keeping a breadth and balance of opportunity

FIG. 3.—HINGES AND ESCUTCHEONS, DESIGNED BY STUDENTS.

which is not possible in a school with a meager course of study, or in a school that is highly specialized.

II.

The above discussion, especially that part of it which refers to the high school of a small city, suggests the further consideration of several problems relating to courses and equipments which are comparatively new.

What follows is essentially a brief statement concerning courses and equipments which have been developing during the past five years at Bradley Polytechnic Institute. In this school all boys in the first and second years of the academy or high school are required to spend five hours a week in shopwork and two and one-half hours in drawing. During these years the girls spend the same amount of time in sewing and drawing. Boys especially interested in the mechanic arts are allowed under certain conditions to take double the required amount of shopwork and drawing, and omit Latin. At the beginning of the third year each student selects one of the six groups of studies—science, engineering, mechanic arts, classics, literature, or general.

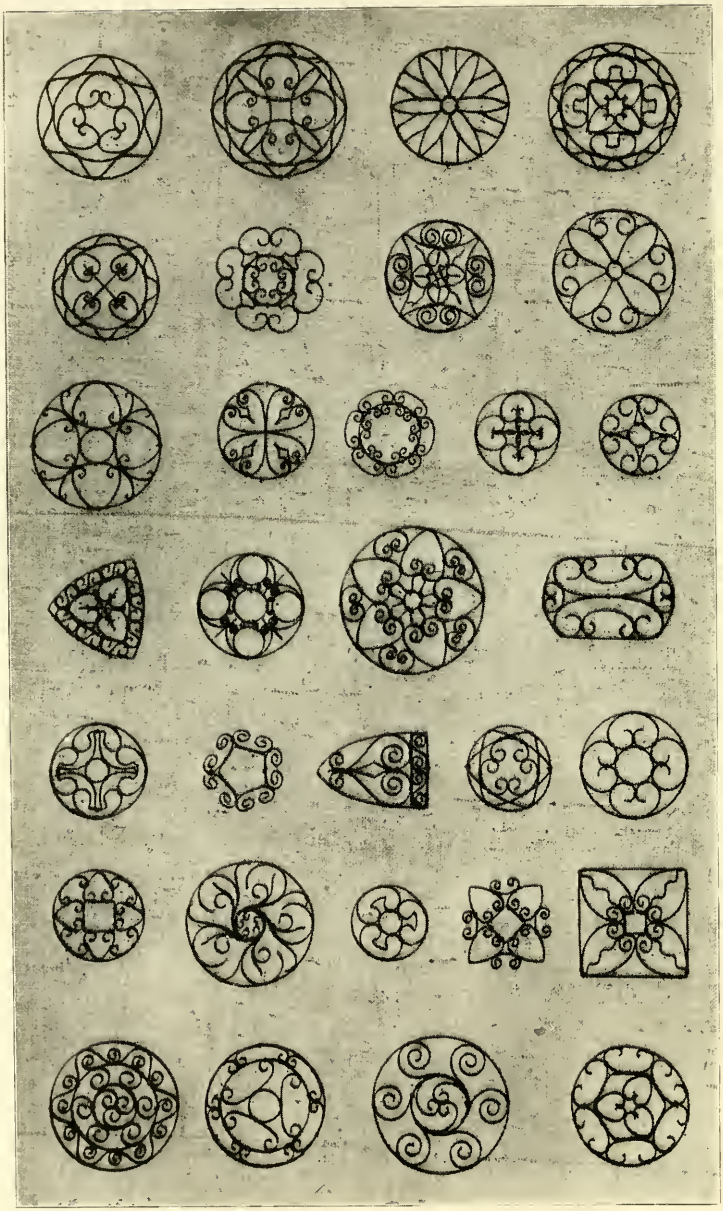


FIG. 4.—FIRST PROBLEM IN BENT-IRON WORK—DESIGNS MADE BY STUDENTS.

During the two remaining years of the academy students who have elected the mechanic-arts group take the maximum amount of manual training and drawing; those who have elected the classics or literature groups take the minimum. The others range between these two limits. This work in manual training, however, given in the last two years of the academy possesses nothing essentially new or suggestive for our present purpose. It includes freehand and mechanical drawing, framing, cabinet-making, pattern-making, foundry work and forging, or machine-tool work. Electrical construction, though regularly a college subject, is sometimes taken by students in the academy. But the

FIG. 5.—SECOND PROBLEM IN BENT-IRON WORK—DESIGNS MADE BY STUDENTS

manual-training work of the first two years of the academy, both as regards courses and equipments, is well suited to the needs of public high schools in small cities, and therefore may be considered here.

The first thing to be made clear in a statement concerning these two lower academy courses is the fact that both of them are pure manual-training courses — courses in handwork for general educational development, one in wood and one in metal. The more technical courses, like pattern-making, involving specific instruction in trade processes and methods, are reserved for later years and, as has already been stated, are not required of all the students in the academy. Each of these two early courses covers a wide range of hand-tool processes, and excludes all processes requiring the use of automatic or semi-automatic machinery. The hand lathe, the sensitive drill, and the grindstone are the only power-driven machines employed.

In the first course are found general benchwork in wood, woodturning, a little wood-carving, a suggestion of cabinet-making, and some elementary work in wood-finishing. The drawing is first mechanical, then freehand, finally a combination of the two, and all the time

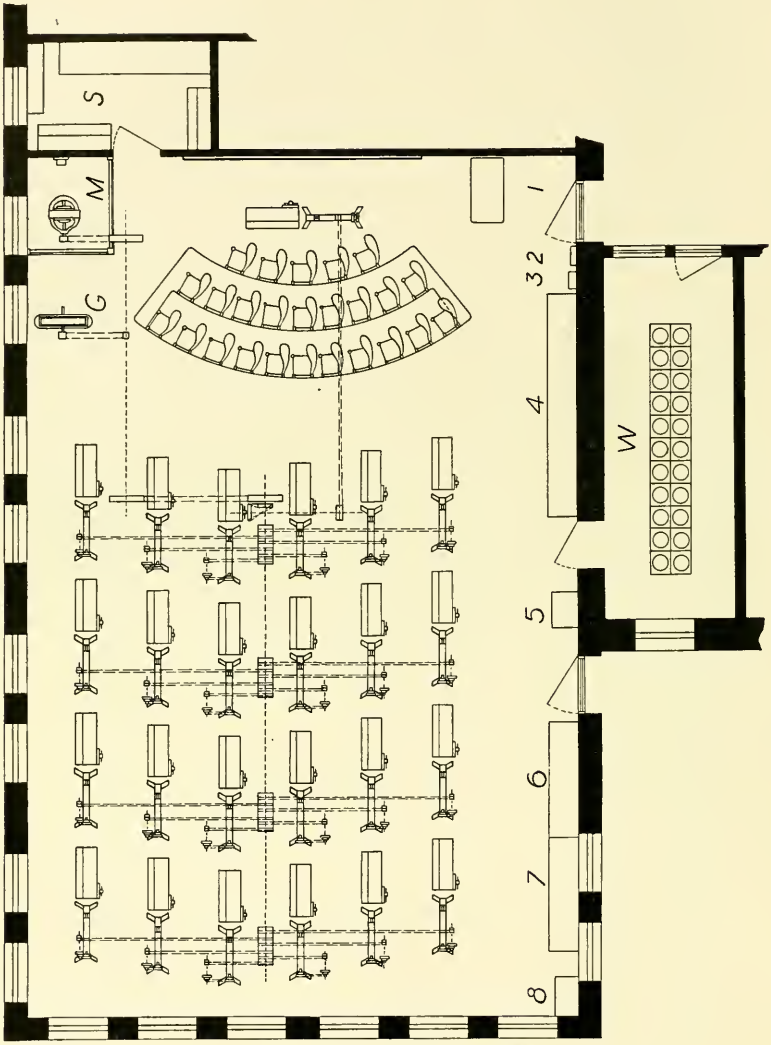


FIG. 6.—WOODWORKING ROOM.
60 × 37 feet.

W = Washroom.
S = Storeroom.
M = Electric motor.
G = Grindstone.

1 = Teacher's desk.
2 = Key board.
3 = Switch board.
4 = Case for unfinished work.

5 = Case for carving tools.
6 = Bench for gluing.
7 = Finishing bench.
8 = Case for finishing materials.

carried on with reference to the shopwork. The course as a whole may be said to be extensive, rather than intensive. The same is also true of the second course. In it are chipping, filing, and finishing cast iron; turning and polishing steel and brass; drilling and filing brass in the making of escutcheons and hinges; fitting a key to a lock; bent-iron work, using both heavy and light metal, bending the metal cold

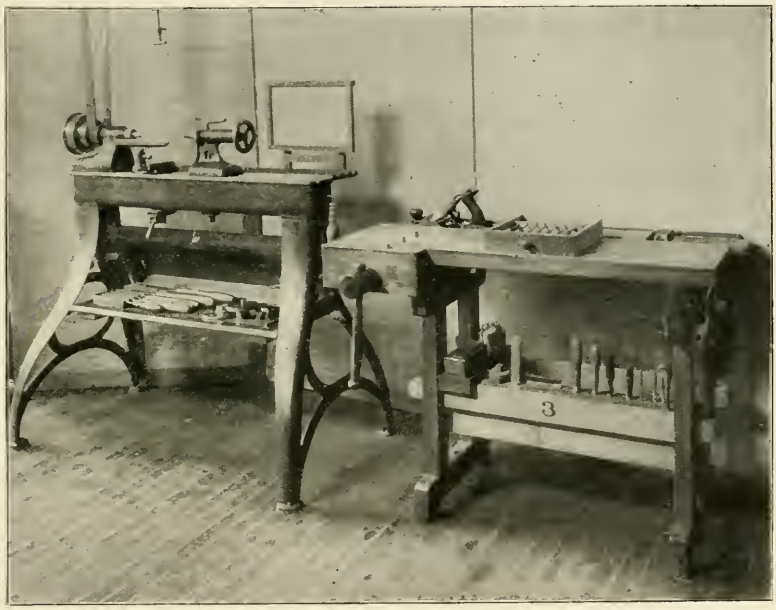


FIG. 7.—WOODWORKING ROOM—UNIT OF EQUIPMENT.

and fastening with rivets and binders; spinning zinc and copper cups, trays, and the like, and polishing them or finishing them in metallic colors; and, finally, soldering and the simpler processes of tinsmithing. In this course also the drawing is planned with reference to the shopwork, the designs for bent-iron work, hinge and escutcheon work, and metal-spinning being made by the students, and developments being studied in the drawing-room, while tin cups, pails, and funnels are being made in the shop. The working out of individual designs and projects occupies nearly half of the time in both these courses.

In both of these courses the aim is not only to give pupils an opportunity to acquire power to execute intelligently for a definite worthy purpose, but also ability to appreciate what has been done by others,

and to gain some knowledge of the source and preparation of the materials used and of the processes employed in the manufacture of the tools. This involves a study of the masterpieces of the past in engineering, architecture, and the "minor arts," and of the best examples of the work of the present day. It also involves a study of forestry, lumbering, mining, and various processes of refining and working natural products. With this in view talks are given, books and magazine articles read, papers written and oral reports given on a variety of subjects connected with trees, mining, lumbering, metallurgy, tool-making, etc. The talks on forestry, lumbering, and architecture have grown into two series of lectures illustrated with the stereopticon and given to several sections of the school at a time. Collections of photographs and engravings of iron work and hardware, pottery, details of buildings and furniture (many of them taken from manufacturers' catalogues) have proven valuable aids. Perhaps most valuable of all are the visits to manufacturing plants in or near the city.

Concerning the equipment for the woodworking course probably little needs to be said beyond calling attention to Figs. 6 and 7, because good equipments for woodworking are not uncommon. Among the leading features of this equipment will be noticed: (1) washroom and storeroom connected with the workroom; (2) the demonstration theater, and its relation to the demonstration bench and lathe and to the blackboard; (3) the relation of benches and lathes to each other and the arrangement of belts to furnish the power from a single central shaft; (4) the case for unfinished work, the carving-tool case, bench for gluing, bench for finishing with case for finishing materials beside it; (5) the tool-sharpening outfit at each bench and the blueprint, drawing, or sketch holder easily transferred from lathe to bench.

The equipment of the metalworking room deserves more detailed description because in many of its features it is unique. However, nearly all of the features pointed out in the woodworking room are found here, but in place of the ordinary grindstone is a wet emery tool grinder and a sensitive drill, and in place of the glue bench is a bench upon which are placed the burring machines, wiring machine, large stakes, and tools for general use in sheet-metal work (see Fig. 9). Each bench is heavy, being made of yellow pine and maple. In front are two drawers, each with a sliding till, and beneath them a compartment with a drop door. These hold all the tools. On the bench is a

4¼-inch vise. Into the middle of the front part of the top is fastened a cast-iron stake plate. Each bench is provided with a small flat-topped cast-iron stake (see Fig. 4). A few larger stakes of different shape are provided for general use. Coming up through the back part of the bench is a gas pipe to which with a rubber hose is attached

FIG. 8.—METALWORKING ROOM.

a soldering furnace. The lathe is provided with centers for turning both wood and metal; also a special spinning center, three rests, two face-plates, and a chuck capable of taking in a rod one inch in diameter. A list of the tools at each bench is as follows:

1-lb. ball peen hammer.
⅝-inch flat cold chisel.
⅜-inch cape chisel.
⅝-inch round-nose chisel.
4½-inch hardened and ground steel try-square.
4-inch steel rule.
Scriber, straight and bent points.
Prick punch.
3-inch spring-dividers.
3-inch outside calipers.
3-inch inside calipers.
Sliding tee bevel.
India oil stone, ½ × 1 × 4 inches.
10-inch hand bastard file.
10-inch second-cut file.
10-inch smooth file.
7-inch bastard pillar file.
7-inch smooth pillar file.
9-inch half-round second-cut file.
5-inch half-round smooth file.
5-inch half-round dead-smooth file.
7-inch round file.
6-inch three-cornered file.

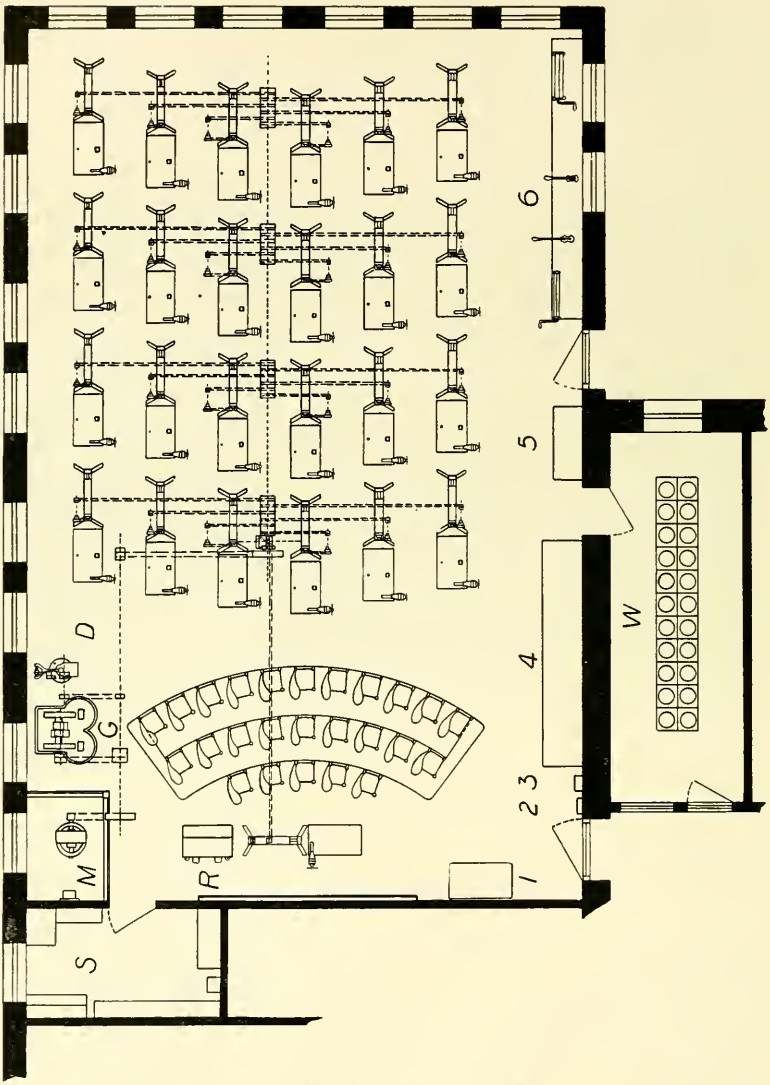


FIG. 9.—METALWORKING ROOM.

60 × 37 feet.

W = Washroom.
S = Storeroom.
M = Electric motor.
G = Wet emery tool grinder.
D = Sensitive drill.
R = Squaring shears.
1 = Instructor's desk.
2 = Key board.
3 = Switch board.
4 = Case for unfinished work.
5 = Finishing table.
6 = Bench for special tools.

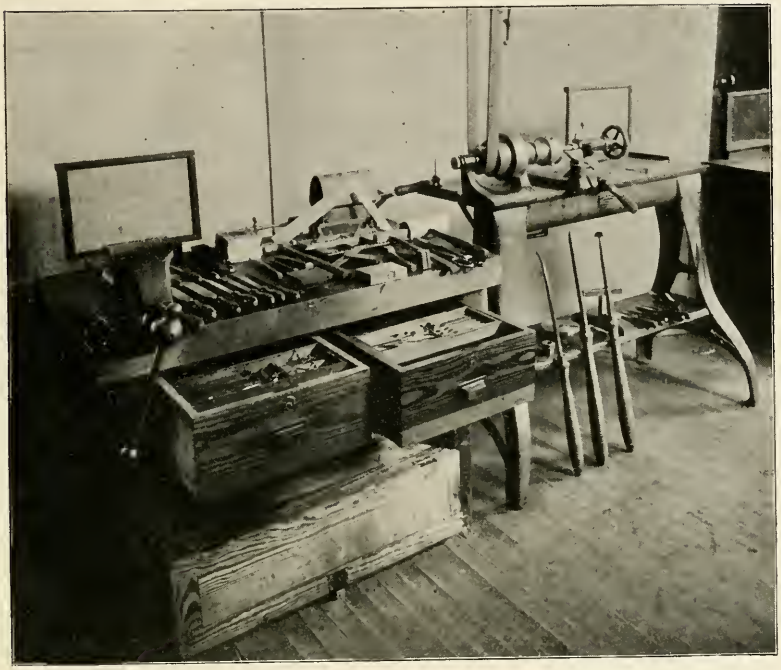


FIG. 10.— METALWORKING ROOM — UNIT OF EQUIPMENT.

6-inch warding file.
File brush and pick.
Two soft brass vise jaws.
Soldering furnace.
Soldering bit.
Brick for tinning soldering bit.
Soldering tray.
12-inch square.
Tinner's mallet.
Tinner's hammer.
Shears.
Wire chisel.
Lantern chisel.
Three tinner's punches.
Two tinner's seamers.
Lead block.
Rivet set.
6-inch wing-dividers.
4½-inch flat-nose pliers.
4½-inch round-nose pliers.
Oil can.
Pounding block.
Diamond-point turning tool.
Cutting-off turning tool.
Small round-nose turning tool.
Large round-nose turning tool.
Scraper (for cast iron) turning tool.
Lathe dog.
Spinning center.
Spinning rest and pin.
Two metal-spinning tools.
Spinning stick.

The cost of equipping the room was as follows :

25 lathes	$1,125.00
25 benches	387.50
25 vises, 4¼ inch	167.00
25 sets of bench and lathe tools, as above	550.12
Electric motor, 8½ horse power	240.00
Shafting, hangers, pulleys, and couplings	151.09
Belting	139.61
Tool grinder	180.00
Sensitive drill	56.30
Squaring shears, metal folder, wiring machine, and a variety of smaller tools for general use	194.84
Two long benches	87.50
Case for unfinished work	125.00
Cases in storeroom	51.00
Demonstration theater, including chairs	76.00
	$3,530.96

No one is able yet to realize fully the possibilities of manual training in cold metals with such an equipment as this; the accompanying illustrations merely suggest a few beginnings. Work may be developed in several directions not suggested here, without additional equipment, and by adding a few more inexpensive tools several distinct lines of development would be made possible. In opportunities for the development of work in the direction of the art-crafts it is certainly far richer than the equipment for woodworking. Teachers of manual training generally have not yet begun to appreciate the value of the hand-tool work in cold metals. It is certain that such an equipment might be utilized with profit for twice the length of time it is at Bradley Polytechnic Institute.

It is fully believed that the two equipments described, with the addition of a jig saw, a large wood-turning lathe, two or three engine lathes and a forge, and two smaller rooms, one containing a circular saw and planer for getting out stock for woodworking classes and the other containing a soft-metal melter, foundry benches, and tools for electrical construction, would enable a small city to carry on a rich four-years' course in manual training for boys.

THE COST OF MANUAL TRAINING.

I.[1]

WILLIAM E. ROBERTS,
Supervisor of Manual Training, Cleveland, O.

THE history of manual training in our country dates back only about fifteen years, but in those fifteen years wonderful changes have taken place in its development. We look back and smile at the absurdities which have paraded under the cloak of manual training—smile if these absurdities were the work of others, but look embarrassed and feel humiliated if they were born of our own thought and hand, and have gone forth as the work of a modern Prometheus, to rise up and claim us as the origin of their existence. And yet, acknowledging much that is grotesque, many errors in the past, I presume that the history of manual training is but the counterpart of the history of every important movement toward social advancement and the betterment of mankind.

The initial step in such a movement is usually the conception of the great central thought by the master-mind, unhampered by details. This central thought compassed, practical applications of details are often projected by minds incapable of fully grasping the larger thought. In this way emphasis is often given to minor considerations, with the result that the principal aim is obscured and its development retarded. One thus applying his thought and energy to the particular phase of the work which appeals most strongly to his tastes and inclinations is liable to give it emphasis entirely out of proportion to its relative value. This unfortunate misunderstanding of relative values has appeared many times in the development of manual training. Details which are simply incidental have been emphasized far beyond their just claim of importance, and often with disastrous results.

Among the most prevalent of these influences blinding to the real purpose of manual training has been the over-importance attached to the place of equipment and accessories to the work. Enthusiasts who have ridden this particular hobby have made exorbitant claims for the necessity and importance of costly buildings and elaborate equip-

[1] This article is the introduction to a series of articles on this subject by Mr. Roberts.

ments. Many evils have resulted: Manual training has been given a prominence in school work which it cannot justly claim upon its own merits; its schools have been housed in expensive buildings which require large sums of money to maintain; rooms have been equipped with costly machines and ingenious mechanical devices devoted to special work, rather than the development of general principles, which will seldom, if ever, be met by the pupil in practical experience—devices which absorb an enormous amount of the teacher's time that should be devoted to educational considerations. These elaborate equipments have in turn required the use of expensive supplies. As a result the relative cost of manual training compared with other school studies has been so great as to place it beyond the means of the school boards of many cities and towns where its introduction has been desired. In some instances the work has been abandoned after being successfully inaugurated, because the expense involved did not seem justified by the returns. An incident or two coming within my personal knowledge will illustrate this point.

A school in one of our large cities was equipped at great expense with elaborate and costly tools of almost every conceivable design and use. Practical experience developed the fact that this costly equipment was such a burden, both upon teachers and pupils, that a large part of it was relegated to the storeroom to be used, in part, for occasional special work.

As another illustration, a principal of manual training in one of our large cities told me of an appropriation of $250,000 which had been made for a manual-training school building in his city, remarking that this was a beggarly amount; that it ought to have been a million dollars; that the city referred to should have a representative manual-training school. Such statements hardly need comment. A million-dollar manual-training school cannot be a representative school, neither can a two hundred and fifty thousand dollar school. Such buildings, and the equipments that would be required, are beyond the reach of almost every public-school system in our country, even if they were desirable and produced the best results as educational institutions.

Representative manual training must be such as will be within the reach of the majority of city school systems. It must take its stand with other studies of the curriculum and, like them, demonstrate value received for outlay. In other words, the cost of manual training that will be generally adopted must not be disproportionate to the cost of other school branches of study.

I have found the study of this problem of economy in manual training one of absorbing interest, for it seems to me that in its solution we shall find one of the greatest possible helps to the more universal introduction of our work.

In presenting these articles it is with the sincere hope that something may be said which will guide others to the solution of the particular parts of the problem which they must meet in their field of work. The whole problem is a great one, and no one person can hope to solve it. No set of ideas or course of work can be applied universally, and no one person can hope to know thoroughly the conditions and requirements of even a small number of the manual-training fields of work, and consequently an article, or series of articles, upon this subject must be limited largely to the experience of the individual writer.

A discussion of the cost of manual training necessarily involves a consideration of equipments and supplies, and such considerations imply suggestions of courses of work which should differ widely to meet the needs of different communities. My purpose is not to present work for which we could make the claim that it would realize the highest ideals in manual-training in every field, but to show that manual training of real value can be provided at comparatively slight expense, and to offset the too general impression that expensive equipment and courses of work involving costly materials must be had before effective work can be attempted. What I shall say will be based almost entirely upon my experience in our Cleveland public schools, and my range of suggestion must necessarily be largely limited by the conditions under which we have worked. These conditions, however, are just such as give an excuse for suggestions of economic methods in manual-training work. Briefly stated, they are something as follows: (1) an exceedingly large field of work; (2) very limited means in proportion to the size of the field; (3) limited time devoted to the work; (4) large classes; in the first six years the classes range from forty to sixty pupils under the direction of a single teacher; (5) untrained teachers. All of the work of the first six years is given by regular room teachers, with such assistance as can be given by brief notes, personal talks, and occasional model lessons.

While, as before stated, I must be somewhat limited in my range of subject, yet within these limitations I shall endeavor to treat the work of the different departments so broadly that the details of the courses of work may be arranged by individual teachers or workers to meet the particular needs and conditions of the field in which they work.

In considering the cost of manual training, the question of equipments is perhaps the most important one, and consequently the treatment of the work of the higher grades should be much the more complete and suggestive.

So much explanation seems necessary to justify what might otherwise seem a very inadequate presentation of the subject, and with this introduction we will take up the work of the different grades.

THE DECORATIVE SIDE OF A COURSE IN FORGING.

II.

WILLIAM C. STIMPSON,
Pratt Institute, Brooklyn, N. Y.

FROM very early times incised lines — or veining, as we shall term them — have been used as a surface decoration on iron-work. Some of the earliest examples are to be seen on hinge-work of about the eleventh century. Here the lines are mainly bold and straight, evidently worked on the iron while hot. In the fourteenth and fifteenth centuries we find them very much used on all of the decorative work — applied often with very great detail, but cut in the metal when cold. In the Renaissance period we find veining very much used, especially on leaf-work. Here it served to emphasize the pipes, veins, and creases in the leaves. The same idea, carried to its greatest elaboration, comes down to us in the etching on the polished steel of the armor and locks of the sixteenth and seventeenth centuries. We can use this style of decoration to advantage in school work because the boys grasp the idea of it readily and execute the work well.

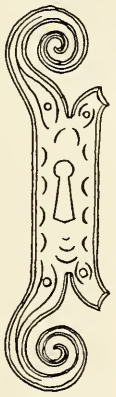


FIG. 14.

The example I have selected for explanation (Fig. 14) is a keyhole escutcheon, the design for which was suggested when looking over a hardware catalogue of one of our leading manufacturers. The project, besides introducing shouldering, gives additional practice in drawing and bending, and on its flat surface we may use veining as a decoration. The shouldering is done to avoid the necessity of splitting the ends for their full length. I shall not dwell on the matter of splitting, leaving that subject for a subsequent article.

Each time this has been given as a class exercise I have used the sketch (*A–D*, Fig. 15) on the blackboard to give the necessary dimensions, and have marked for each boy, on a convenient-sized piece of three-eighths-inch pine, from a model piece, the outline of one scrolled end, as a guide for the over-all shape of the ends. The finished scroll must be judged by the boy himself. For laying off the keyhole I provide one sheet-metal templet.

Our boys have had practice in shouldering with their machine forgings, and they have learned that it is best to shoulder iron, owing to its fibrous nature, at a moderately high heat, cutting in over the rounding edge of the anvil. They have also learned that they can get the most out of their heat if they draw the end to an approximate taper before making the shoulder.

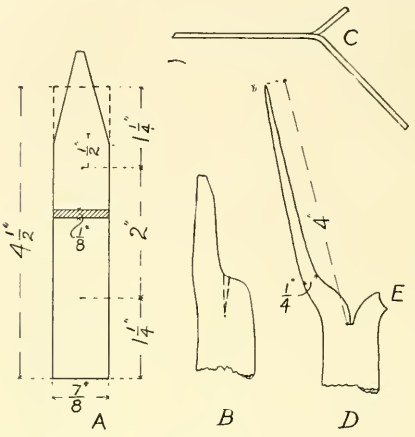


Fig. 15.

The first two sketches (Fig. 15) show the size of stock used for this exercise and the position of the guiding punch marks, two inches apart. *A* shows the first taper formed, and *B* the shoulder worked on. The point for making the shoulder—one-half inch above the punch marks—must be judged by the eye.

The cut or split (see *B*) is made with a hot chisel. Then the two ends are bent out sideways, as at *C*, so that we can get at them and forge them over the horn with hammer blows. The end, *E*, is drawn to the proper width and cut to length; then the long end is drawn to the correct dimension. The bottom of cut is defined by means of a hacksaw or smoothed up entirely with a half-round file. We use here an eight-inch second-cut file, providing one for each vise in the shop.

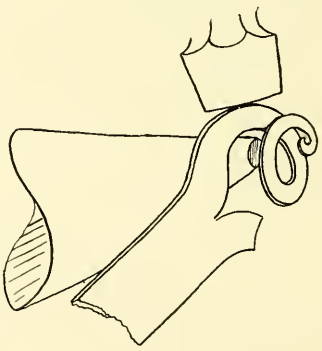


Fig. 16.

When both ends have been worked out to this stage, all the face edges are chamfered. It is interesting to note what a decorative effect this simple matter of chamfering gives to an otherwise stiff line. We should aim for broad, free effects—natural blows of the hammer—not for mechanical accuracy. A pleasing variation can he produced by using the peen instead of the face of the hammer. For getting into sharp corners a common riveting hammer is often useful. The chamfering is best done at a black heat, with the work held close to the edge of the anvil

so that the corner of the hammer shall not strike the hardened face.

In scrolling up the tapered end, judicious handling should enable almost the entire length to be bent up freehand with the hammer, as indicated in Fig. 5 of the previous article.[1]

Fig. 17.

For truing up the following methods are helpful: First heat the scroll and force the center of it forward; the outer members may thus be caught on the end of the horn and bent true with the hammer, as in Fig. 16. Considerable truing may be done in this way. Then the work is again set down flat. Should the spacing between the scroll members be uneven, it can be adjusted at a low heat by inserting the screw-driver-shaped end of the bending wrench (Fig. 9, Article I) and prying the members into position by a twisting movement of the wrench (Fig. 17). If only slight alteration be needed, the heat will be uniform, and we rely upon the varying stiffness due to the taper of the work to effect the adjustment. If there are short curves, the part beyond the defect had best be cooled before prying against it. In cooling very small ends like these, rapidity of action is essential. It is best to form some sort of lip in the dipper and hold that lip tight against the iron before pouring the water; in this way the work may be cooled at just the point desired.

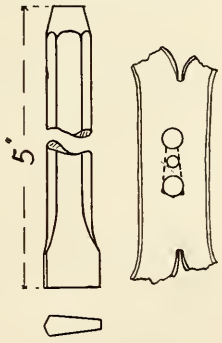


Fig. 18.

In laying off the keyhole we may use a tin templet or scribe a center line on the back of the piece and put in, by measurement, the necessary punch marks for drilling. To form the keyhole, drill a hole full size for the top, another at the bottom, and a smaller hole, or holes, between for clearance. The ward hole is now punched out cold. Place the work face downward on the anvil and drive in the drift

[1] Manual Training Magazine, Vol. II, p. 218.

punch (Fig. 18), being very careful to have it hang central. The burr is driven through from the face side, with the work first resting on the anvil, then on the end grain of a block of hard wood. Use a ward file, if need be, for truing up. Sometimes a slip occurs and the ward will not be central. To remedy this, first file back to the dotted line, as in *A*, Fig. 19, re-marked from templet; then turn the work, and with peen of hammer draw the metal into the hole and upper part of ward, as in *B*, Fig. 19. Now, from the face side, re-mark from templet and file to line with rat-tail and ward file. The filing required on this piece is so slight that one six-inch second cut rat-tail and a six-inch second-cut ward file will generally be found sufficient for the whole class.

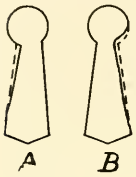


FIG. 19.

Since the veining of this exercise is largely useful as practice work, the design should be as simple as possible, aiming mainly to break up the otherwise flat surface by a pleasing space relation between the chamfer of the edge of the escutcheon and the keyhole in the middle of it.

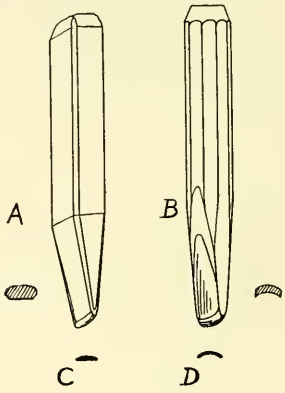


FIG. 20.

I have allowed the boys to work out their own designs here, and obtained good results. The student first works out his design on paper, then sketches it on the iron with slate pencil or red lead pencil. The veining is done cold — the work placed on a convenient cast-iron bench block, or on the anvil. A block is preferable, as it will have a plane surface and be rougher than the anvil, so that the work is less liable to slip. If the work can be clamped, all the better.

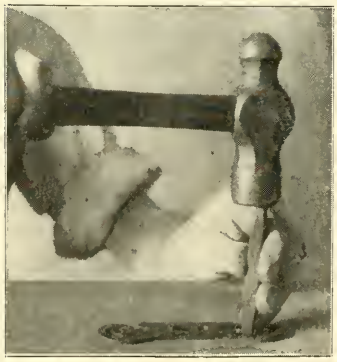


FIG. 21.

The tools used are short and stiff. They are best made of one-fourth-inch to three-eighths-inch square steel about three and one-fourth inches long when finished. There are two styles. *A*, Fig. 20, shows a veining tool drawn down like a thick cold chisel, only with one side of the tapered end

rounded. Grinding this tool from both sides leaves the edge convex. The sharpness of the edge is smoothed off and all sharp corners rounded over, and the tool is ready for use. It makes an impression as at *C*, except that in the iron it raises a burr on the rounding side, which tends to give more of a crescent effect. With this tool, however, either straight or curved lines may be run. In tracing lines, the tool is held in the left hand with its top slanting a little outward; the hammer strikes on the near side of the head, and the workman guides the tool so that with each blow it jumps a little toward him (Fig. 21). With a little practice good lines may be run in this way quite rapidly. With half a dozen of these tools, varying in width from one-eighth inch to three-eighths inch and in degree of curvature, almost any effect of veining may be produced.

Fig. 22.

The other form (*B*, Fig. 20) is convenient where much duplication is required. For about an inch from the end the inside is grooved — the outside rounded; it is ground curving on the end, somewhat resembling a turner's gouge. All edges and corners are smoothly rounded. The principal advantage of this tool is that it cuts a smooth, crescent curve with one blow of the hammer; its disadvantage lies in this very limitation. Still, as the middle of the cutting edge touches the work first, it is possible to vary the curve to a slight extent. Should the escutcheon become bent in veining, do not strike the face with a steel hammer — use a lead or wooden mallet. The decoration being finished and the work straightened, give it a black finish from the fire, and the piece is complete.

Fig. 22 shows three examples of the escutcheon described above.

The two outer ones are examples of students' designs in veining ; the middle one is shown plain by contrast. The latch illustrates a different application of the same design. The two escutcheons shown at the bottom are good for extremely simple exercises, and their finished shape can be almost entirely produced under the hammer. The two upper ones illustrate straight-line veining, but they are not very characteristic as forging exercises.

ASSOCIATIONS.

UNIVERSITY OF CHICAGO CONFERENCE OF ACADEMIES AND HIGH SCHOOLS.

THE following is an extract from a paper read on the eighth of November by Professor John Dewey before the fifteenth educational conference of the academies and high schools affiliating or co-operating with the University of Chicago. The title of the paper was "Current Problems in Secondary Education":

I have reserved the group of problems bearing upon the formation of a curriculum until the last. From the practical side, however, we probably find here the problems which confront the average teacher most urgently and persistently. This, I take it, is because all the other influences impinge at this point. The problem of just what time is to be given respectively to mathematics, and classics, and modern languages, and history, and English, and the sciences — physical, biological — is one the high-school teacher has always with him. To adjust the respective claims of the different studies and get a result which is at once harmonious and workable, is a task which almost defies human capacity. The problem, however, is not a separate problem. It is so pressing just because it is at this point that all the other forces meet. The adjustment of studies, and courses of study, is the ground upon which the practical solution and working adjustment of all other problems must be sought and found. It is as an effect of other deep-lying and far-reaching historic and social causes that the conflict of studies is to be treated.

There is one matter constantly accompanying any practical problem which at first sight is extremely discouraging. Before we get our older problems worked out to any degree of satisfaction, new and greater problems are upon us, threatening to overwhelm us. Such is the present educational situation. It would seem as if the question of adjusting the conflicts already referred to, which have so taxed the time and energy of high-school teachers for the past generation, were quite enough. But no; before we have arrived at anything approaching consensus of opinion, the larger city schools at least find the conflict raging in a new spot — still other studies and lines of study are demanding recognition. We have the uprearing of the commercial high school; of the manual-training high school.

At first the difficulty of the problem was avoided or evaded, because distinct and separate high schools were erected to meet these purposes. The current now seems to be in the other direction. A generation ago it was practically necessary to isolate the manual-training course of study in order that it might receive due attention, and be worked out under fairly favorable influences. Fifteen years ago the same was essentially true of the commercial courses. Now, however, there are many signs of the times indicating that the situation is ripe for interaction — the problem is now the introduction of manual-training and commercial courses as integral and organic parts of a city high school. Demands are also made for the introduction of more work in the line of fine art, drawing, music, and the application of design to industry; and for

the introduction of a larger number of specifically sociological studies — this independent of those studies which naturally form a part of the so-called commercial course.

At first sight, as just intimated, the introduction of these new difficulties before we are half way through our old ones is exceedingly distressing. But more than once the longest way around has proved the shortest way home. When new problems emerge, it must mean, after all, that certain essential conditions of the old problem had been ignored, and consequently that any solution reached simply in terms of the recognized factors would have been partial and temporary. I am inclined to think that in the present case the introduction of these new problems will ultimately prove enlightening rather than confusing. They serve to generalize the older problems, and to make their factors stand out in clearer relief.

In the future it is going to be less and less a matter of worrying over the respective merits of the ancient and modern languages, or of the inherent values of scientific *vs.* humanistic study, and more a question of discovering and observing certain broader lines of cleavage, which affect equally the disposition and power of the individual, and the social callings for which education ought to prepare the individual. It will be, in my judgment, less and less a question of piecing together certain studies in a more or less mechanical way in order to make out a so-called course of study running through a certain number of years; and more and more a question of grouping studies together according to their natural mutual affinities and reinforcements for the securing of certain well-marked ends.

For this reason I welcome the introduction into the arena of discussion of the question of providing courses in commerce and sociology, in the fine and applied arts, and in technological training. I think henceforth certain fundamental issues will stand out more clearly and have to be met upon a wider basis and dealt with on a wider scale. As I see the matter, this change will require the concentration of attention upon these two points: first, what groups of studies will most serviceably recognize the typical divisions of labor, the typical callings in society, callings which are absolutely indispensable to the spiritual as well as to the material ends of society; and, secondly, not to do detriment to the real culture of the individual, or, if this seems too negative a statement, to secure for him the full use and control of his own powers. From this point of view, I think that certain of the problems just referred to, as, for instance, the conflict of language and science, will be put in a new perspective, will be capable of approach from a different angle; and that because of this new approach many of the knotty problems which have embarrassed us in the past will disappear.

Permit me to repeat in a somewhat more explicit way the benefits which I expect to flow from the expansion of the regular high school in making room for commercial, manual, and æsthetic studies. In the first place, it will provide for the recognition and the representation of all the typical occupations that are found in society. Thus it will make the working relationship between the secondary school and life a free and all-around one. It will complete the circuit — it will round out the present series of segmental acts into a whole. Now, this fact will put all the school studies in a new light. They can be looked at in the place they normally occupy in the whole circle of human activities. As long as social values and aims are only partially represented in the school, it is not possible to employ the standard of social value in a complete way. A continual angle of refraction and distortion is introduced in viewing existing studies, through the fact that they are looked at from an artificial standpoint. Even those studies which are popularly regarded as preparing distinctively for life rather than

for college cannot get their full meaning, cannot be judged correctly, until the life for which they are said to be a preparation receives a fuller and more balanced representation in the school. While, on the other hand, the more scholastic studies, if I may use the expression, cannot relate themselves properly so long as the branches which give them their ultimate *raison d'être* and sphere of application in the whole of life are non-existent in the curriculum.

For a certain type of mind algebra and geometry are their own justification. They appeal to such students for the intellectual satisfaction they supply, and as preparation for the play of the intellect in further studies. But to another type of mind these studies are relatively dead and meaningless until surrounded with a context of obvious bearings — such as furnished in manual-training studies. The latter, however, are rendered unduly utilitarian and narrow when isolated. Just as in life the technological pursuits reach out and affect society on all sides, so in the school corresponding studies need to be imbedded in a broad and deep matrix.

In the second place, as previously suggested, the explanation of the high school simplifies instead of complicates the college-preparatory problem. This is because the college is going through an analogous evolution in the introduction of similar lines of work. It is expanding in technological and commercial directions. To be sure, the branch of fine and applied arts is still practically omitted; it is left to the tender mercies of over-specialized and more or less mercenary institutions — schools where these things are taught more or less as trades, and for the sake of making money. But the same influences which have already rescued medical and commercial education from similar conditions, and have brought to bear upon them the wider outlook and more expert method of the university, will in time make themselves also felt as regards the teaching of art.

Thirdly, the wider high school relieves many of the difficulties in the adequate treatment of the individual as an individual. It brings the individual into a wider sphere of contacts, and thus makes it possible to test him and his capacity more thoroughly. It makes it possible to get at and remedy his weak points by balancing more evenly the influences that play upon him. In my judgment, many of the problems now dealt with under the general head of election *vs.* prescription can be got at more correctly, and handled more efficiently, from the standpoint of the elastic *vs.* the rigid curriculum — and elasticity can be had only where there is breadth. The need is not so much an appeal to the untried and more or less capricious choice of the individual as for a region of opportunities large enough and balanced enough to meet the individual on his every side, and provide for him that which is necessary to arouse and direct.

Finally, the objection usually urged to the broader high school is, when rightly considered, the strongest argument for its existence. I mean the objection that the introduction of manual training and commercial studies is a cowardly surrender on the part of liberal culture, of the training of the man as a man, to utilitarian demands for specialized adaptation to narrow callings. There is nothing in any one study or any one calling which makes it in and of itself low or meanly practical. It is all a question of its isolation or of its setting. It is not the mere syntactical structure or etymological content of the Latin language which has made it for centuries such an unrivaled educational instrument. There are dialects of semi-barbarous tribes which in intricacy of sentential structure and delicacy of relationship are quite equal to Latin in this respect. It is the context of the Latin language, the wealth of associa-

tion and suggestion belonging to it from its position in the history of human civilization, that freight it with such meaning.

Now, the callings that are represented by manual training und commercial studies are absolutely indispensable to human life. They afford the most permanent and persistent occupations of the great majority of human kind. They present man with his most perplexing problems; they stimulate him to the most strenuous putting forth of effort. To indict a whole nation were a grateful task compared with labeling such occupations as low or narrow — lacking in all that makes for training and culture. The professed and professional representative of "culture" may well hesitate to cast the first stone. It may be that it is nothing in these pursuits themselves which gives them utilitarian and materialistic quality, but rather the exclusive selfishness with which he has endeavored to hold on to and monopolize the fruits of the spirit.

And so with the corresponding studies in the high school. Isolated, they may be chargeable with the defects of which they are accused. But they are convicted in this respect only because they have first been condemned to isolation. As representatives of serious and permanent interest of humanity, they possess an intrinsic dignity which it is the business of the educator to take an account of. To ignore them, to deny them a rightful position in the educational circle, is to maintain within society that very cleft between so-called material and spiritual interests which it is the business of education to strive to overcome. These studies root themselves in science; they have their trunk in human history, and they flower in the worthiest and fairest forms of human service.

It is for these various resons that I believe the introduction of the new problem of adjustment of studies will help instead of hinder the settlement of the older controversies. We have been trying for a long time to fix a curriculum upon a basis of certain vague and general educational ideals: information, utility, discipline, culture. I believe that much of our ill success has been due to the lack of any well-defined and controllable meaning attaching to these terms. The discussion remains necessarily in the region of mere opinion when the measuring rods are subject to change with the standpoint and wishes of the individual. Take any body of persons, however intelligent and however conscientious, and ask them to value and arrange studies from the standpoint of culture, discipline, and utility, and they will of necessity arrive at very different results, depending upon their own temperament and more or less accidental experience — and this none the less because of their intelligence and conscientiousness.

With the rounding out of the high school to meet all the needs of life, the standard changes. It ceases to be these vague abstractions. We get, relatively speaking, a scientific problem — that is, a problem with definite data and definite methods of attack. We are no longer concerned with abstract appraisal of studies by the measuring rod of culture or discipline. Our problem is rather to study the typical necessities of social life, and the actual nature of the individual in his specific needs and capacities. Our task is, on one hand, to select and adjust the studies with reference to the nature of the individual thus discovered; and, on the other hand, to order and group them so that they shall most definitely and systematically represent the chief lines of social endeavor and social achievement.

Difficult as these problems may be in practice, they are yet inherently capable of solution. It is a definite problem, a scientific problem, to discover what the nature of the individual is and what his best growth calls for. It is a definite problem, a scientific problem, to discover the typical vocations of society, and to find out what group-

ings of studies will be the most likely instruments to subserve these vocations. To dissipate the clouds of opinion; to restrict the influence of abstract and conceited argument; to stimulate the spirit of inquiry into actual fact; to further the control of the conduct of the school by the truths thus scientifically discovered — these are the benefits which we may anticipate with the advent of this problem of the wider high school.

ILLINOIS SCHOOLMASTERS' CLUB.

THE winter meeting of the Illinois Schoolmasters' Club in Peoria, February 7 and 8, was marked by a short, pointed paper on "The Technical High School," by Dr. Luis C. Monin, of Armour Institute, Chicago. Professor Monin showed the great need of better opportunities for technical education of secondary-school grade, and then submitted a three-years' technical high-school course of study which, he believed, if generally adopted, would supply this need.

It is a significant fact that every member of the club seemed to agree with Professor Monin in his fundamental proposition, though it was evident that a large majority would disagree with his course of study, especially if it were to be carried out at public expense and independent of the high schools already organized. Indeed, the opposition to the independent high school, led by Professor Stratton Brooks, of the University of Illinois, seemed to indicate that it is unnecessary, unwise, and unpractical to attempt to establish independent public technical high schools in the cities of Illinois. Such an attempt, it was feared, would postpone the whole matter indefinitely in most places, and tend toward educational and political confusion in the others, by raising invidious distinctions. The sentiment seemed to be strong in favor of broadening and enriching the established high schools by adding technical studies as rapidly as local conditions would permit.

In closing the discussion, Professor Monin rose to the occasion in a most happy manner when he said that, after all, the details of organization must be subject to local conditions, but that the essential thing, upon which all seemed to be agreed, was that the demand for more definite technical instruction is a legitimate one, and should be met.

The following is made up of extracts from Professor Monin's paper:

The school system of the United States has been pronounced the most complete, the most elastic, and the most perfect system of education existing; evolved in answer to the peculiar needs and conditions of the western hemisphere. With the public schools (kindergartens, primary schools, grammar schools, high schools), with the numerous academies and colleges of every shade and grade of educational creed, and with the universities, these stars of first magnitude, the people of the United States have equaled, if not surpassed, the European nations "all along the line." And yet the rapid industrial development and the unsurpassed economic expansion of the last decade call already for a readjustment of the existing educational facilities to the growing importance of skilled workmanship and the demand for a technical education. What is needed today, besides the highly specialized training furnished by the universities and technical colleges to young men of good abilities, is the training of the great bulk of our workmen in shop, factory, drafting room, or surveyor's office.

The problem of educating the civil engineer, or the mechanical and electrical engineer, has been admirably solved by many technical colleges in the country. They rank in their chosen field of work with the highest institutions of learning, and

will continue to attract the master-minds in mathematics, physics, chemistry, or architecture. But the great number of those who are compelled to begin the struggle for a living and to enter the fierce strife of competition with a grammar-school graduation as their highest ambition and the "finishing touch" of their school life, still look in vain for institutions where a comprehensive and thorough training in applied science can be obtained.

The high school seems to be very much in the same position as the church, *i. e.*, it takes good care of those that are in it, but has no hold upon the many thousands outside of its fold. The duty of a public institution, however, is to reach all the people.

The power of ideas is great, and to work in the service of culture and science is noble, yet our schoolmen and educational philosophers often forget the real power which alone is able to transform ideas and ideals into realities. This power is the economic success of the individual, as well as that of the nation. Without it — I venture the assertion — neither nation nor individual is a moral success. Should it not be the duty of the school, then, to lend a helping hand to the youth who is desirous of acquiring the skill and the discipline necessary for successful toil!

The institution called upon in the near future to supply the kind of education which "unites professional and culture interests into a unity of purpose" will have a character and aims distinctly different from the other established schools. It will neither be a high school, nor a manual-training school, nor a trade school.

It will not be a high school, since the culture element will be subordinate to practical training. Manual training will not be taught, although the excellencies of this branch of study are recognized. Manual training, as the term is now understood, may be regarded as the time of incubation for the technical high school. In a recent article on "The Place of Industrial and Technical Training in Popular Education" (*Technology Review*, January, 1902, p. 10), Dr. Henry S. Pritchett, president of the Massachusetts Institute of Technology, expresses himself as follows with regard to manual training: "Instruction in manual training forms in this country practically a culture study; it contributes almost nothing to the betterment of those in trades. Granting much that has been claimed for manual training, it seems nevertheless true that, in this country at least, it has done almost nothing to bridge over the difficulties which lie between the untrained apprentice and the skilled artisan. This has been due in some measure, it seems to me, to the great fear which its advocates have had lest it minister to utilitarian ends, and to their intense desire to have it, first of all, rank in dignity with older studies. Their attitude reminds one, in some measure, of the toast offered by a senior wrangler, when he said: 'Here's to pure mathematics, and may it never be of any use to anybody!' — instead of a general instruction in using tools or in designing things, practical subjects will be taught, as pattern-making, forging, foundry and machine-shop practice."

The new school, however, will not be a trade school, as its activity is not limited to the teaching of one particular trade, but embodies in its curriculum such studies as not merely will enable a young man to carry on his business, but will also give him the knowledge necessary for good citizenship and the culture demanded by the standard of life of the large middle class. In the technical high school a boy should be able to fit himself for industrial pursuits, and a girl should receive instruction in the "home-making arts." Instruction should be practical and fruitful of immediate results. All the courses, therefore, should lead toward specific employment.

The ideal curriculum of the technical high school is the one that is "thorough enough to produce readiness in the subject studied, and at the same time wide enough to produce a fairly uniform all-round development."

How the trades unions in our country will view such schools, and what attitude they will assume toward the graduates of technical high schools, may be thought by many to be a matter of serious consideration. However, this may be left confidently to the fairness and justice of the American people, who will certainly not deny the rising generation opportunities and possibilities of a broader life, which they themselves either desired or partly enjoyed. Besides, it is not proposed to prepare apprentices ready to step into competition with the older practical workmen employed in a trade, but to furnish the students with the educational principles, the knowledge and training, necessary to go through an apprenticeship in a shorter time and with a better outlook for success than was the case heretofore. The most important thing, indeed, to the successful outcome of such an undertaking is the interest of the workingmen themselves. They must be made to see the justice and the usefulness of such an extension of the public-school system, and must co-operate with the school authorities in a work which will be of the greatest benefit to their own children. For, considering the importance of secondary technical education and its far-reaching influence upon national life, it would seem that matters should not be left to private enterprise alone, but that boards of education should make a united effort toward a clearly formulated aim in order to establish such schools as an integral part of the public-school system of the United States. Said Lanson: "We live in an industrial, practical age; we must satisfy utilitarian inclinations, economic needs, and yet save the culture of the man and the citizen."

The following is offered as a trial course, subject to change according to the needs of the community or student:

COURSE FOR BOYS. (Ten months.)		COURSE FOR GIRLS. (Ten months.)	
FIRST YEAR.			
Arithmetic and bookkeeping	5	Arithmetic and bookkeeping	5
English and geography	5	English and geography	5
General history	3	General history	3
Freehand drawing	4	Freehand drawing	4
Shop practice (carpentry, wood-carving, wood-turning, pattern-making)	10	Plain and machine sewing or industrial art	10
Total	27	Total	27
SECOND YEAR.			
Algebra and plane geometry	5	Nature study	3
English and civil government	3	English and civil government	3
Physics	5	Millinery (for 3 months), dressmaking (for 7 months), or industrial art	20
Mechanical drawing	4	Total	26
Shop practice (forging, machinist's work with hand and machine tools)	12		
Total	29		

THIRD YEAR.

Solid geometry and plane trigonometry	5	Physiology and hygiene	3
English	2	English	2
Machine design	4	Household economy (for 3 months), cooking (for 7 months), or industrial art, or shorthand and typewriting	20
Shop practice (machinist's work with machine tools, construction of machinery, power station management)	20	Total	25
Total	30		

CALIFORNIA STATE TEACHERS' ASSOCIATION.

ONE of the most interesting parts of the meeting of the California State Teachers' Association, at Pacific Grove, was the session of the Department of Manual Training and Drawing, held January 3, 1902. James E. Addicott, of the San José State Normal School, was president of the department, and A. B. Clark, of Stanford University, secretary.

"The Development of the Artistic Side of Manual Training" was the topic championed by Mr. Edwin R. Snyder, of Alameda. He showed how a plain picture frame could be developed and ornamented. The model must serve as a basis of work and may be ornamented by carving or color work. Among the girls especially pyrography is an important factor. The child should be given that to do in which he is most interested. The more artistic the thing, the more interest on the part of the child.

Miss Edith A. Rich, head of the manual-training school of Santa Barbara, spoke on "Paper-Work, Whittling, and Sewing for Country Schools." The paper-work should occupy one half-hour per week for two years. This first work will give to the pupils a vocabulary for use in the manual-training work. Miss Rich advocates the using of ordinary detail paper, believing that the pupils will furnish the more ornamental papers and do work at home. In the country schools, patching, darning, and hemming can be done. As a result the children will come to school with clothes in better condition, just as work in paper-folding results in children coming with cleaner faces and hands.

Chairman Addicott gave a short account of the growth of manual training since it was first taken up for discussion by the California Association in 1893. At that time there were only three trained teachers of the subject in the state, while at the present time the leading cities of the state offer the work, and four out of five normal schools give brief courses to their students. Throop Polytechnic Institute, Wilmerding School, California School of Mechanical Arts, Cogswell Polytechnic College, and the Polytechnic High School are all well equipped for manual-training work.

"Form Impression" was discussed by Mr. M. Doyle, of San Francisco. He showed how the idea of form could be impressed upon the pupil by having the board foot cut into cubes of one-inch surface, and made to duplicate any shaped piece of timber containing one board foot. The pupil must work from the common forms to the more intricate. Decoration should accompany construction, as art is natural to man.

Mr. E. E. Goodell, of San Francisco, in speaking of "What Models Are Best in Grammar Grades?" said that a model to be good must be a serviceable article. What models are made must depend upon the environment of the pupil. The models must be such as may be used by others; they must not be exercises or mere trinkets. The size of a given model may be determined by the individual pupil.

"What Should Be the Aim in Teaching Art in the Public Schools?" was the topic of Miss Calthea Vivian, head of the drawing department of the San José State Normal. She said: "If you succeed in developing appreciation from any standpoint, you will succeed." Different artists should be discussed and some of their productions secured. These should be studied, but not analytically. Compare the good with the cheap picture. Lead up to the higher culture by creating, not by copying.

The discussion of various topics was further carried on by C. H. Meeker, of Pacific Grove, who gave a brief account of the growth of manual training at that place; by Mrs. Florence P. Jackson, of Haywards; Miss Katherine Ball, of San Francisco; Mr. Ward, Mr. Kenyon, Professor Clark, and others.

Among the visitors present was Professor M. V. O'Shea, of the University of Wisconsin, who spoke interestingly upon the necessity of making the people see the importance of manual training, thus correcting the misconception generally existing as to its being the mastery of the use of tools. Help them to see that a function of manual training is to develop intellect, to give an exact appreciation of the moral laws, to make a keener mind; in fact, that it is an organic part of the general educational work.

That the meeting was a profitable and interesting one is shown by the necessity of calling an extra session of the department for the afternoon in order to complete the work laid out. At this time, after finishing the discussions, the same officers were re-elected for the coming year.— F. R. CAUCH.

SOUTHERN CALIFORNIA TEACHERS' ASSOCIATION.

THE manual-training round table of the Southern California Teachers' Association was held at Los Angeles, on December 19, 1901. The chairman of the meeting was Miss Hattie F. Gower, of Los Angeles, while Miss Florence A. Stevenson, of the same city, acted as secretary.

Principal J. H. Francis of the Los Angeles Commercial High School read a paper upon "The Growth of Manual Training in Education." He was followed by Mr. Charles M. Miller, of the Los Angeles State Normal School, with a paper entitled "Industries." Mr. Miller quoted Commissioner Wright in his contrast of the apprenticeship system with the trade schools, showing that the boy under the former system has to do, at first, much more than he is paid for doing, and so acquires the habit of earning no more than for what he is paid. Under the latter system the boy utilizes his whole time, and eventually commands the wages due him, and acquires a general education as well.

Henry Dyer was quoted as giving utterance to the idea that the apprenticeship system is injurious to labor and to the public generally. The need of trade schools was spoken of. One authority was quoted as saying: "Out of every hundred boys that graduate from our grammar schools, 1 per cent. become lawyers, 1 per cent. physicians, and 5 per cent. business-men. The remaining 92 per cent. gain a

livelihood by means of hand labor. Are we doing all we can for the 92 per cent.?" "Manual training," said the speaker, "must come in to supplement as well as specifically develop." Miss Ingraham drew a word picture of two types of first-grade schoolrooms; the one where absolute quiet and order prevails, being painfully calm; the other room being in a healthy natural state, the pupils standing or sitting as they work at basket-making. Miss Ingraham believes in the resourceful powers of the American teacher, and that she will, sooner or later, approach the ideal in the new education.

In closing, the speaker quoted from Dewey's *The School and Society*, where he says: "All studies arise from aspects of one earth and one life lived upon it — when the child lives in varied, but concrete and active relationship to this common world, his studies are naturally unified. It will no longer be a problem to correlate studies. The teacher will not have to resort to all sorts of devices to weave a little arithmetic into the history lesson, and the like. Relate the school to life, and all studies are necessarily correlated."

At the primary-section meeting of the general association, December 20, Professor Harry M. Shafer, of the San Diego State Normal, presented a strong paper entitled "Manual Training; Handwork and its Relation to the Mental Activities." The points were considered under the following heads:

1. The physical and the mental are inseparably connected.

2. The natural development of the individual necessitates an abundant use of the motor powers.

3. The attainment of the aim of education requires the exercise of expression through the motor powers.

4. This expression will (*a*) largely take the form of handwork; (*b*) derive much of its subject-matter from other subjects of the curriculum.

5. The situation as to manual training is: (*a*) its cost is excessive as compared with other school subjects, and, therefore, it is beyond the reach of the majority of schools; (*b*) it requires too many specially trained teachers in its application, and it is too difficult of application by the regular grade teacher.

6. Some account was given, very briefly, of experiments being made along this line at the San Diego Normal School.—ARTHUR H. CHAMBERLAIN.

NEW ENGLAND ASSOCIATION OF TEACHERS OF METAL WORK.

THE seventh semi-annual meeting of the New England Association of Teachers of Metal Work was held in New Haven, Conn., November 29 and 30, 1901. In accordance with the program previously published, the members of the association who were able to be in New Haven on Friday morning visited the works of the Geometric Drill Co. and the Greist Manufacturing Co.

In the afternoon the Hoggson Pettis Co., manufacturers of Sweetland chucks, and the Wm. F. Schollborn Co. were visited. At the latter place each member was presented with three pairs of pliers of various kinds as souvenirs of the visit.

In the evening an informal meeting was held at the hotel, at which various subjects interesting to those present were discussed.

Saturday morning the membership of the association met at the Boardman Manual Training School, visiting the different departments of the school under the

guidance of Principal Mather and Mr. Jenkins. Later they went to the Hillhouse High School and listened to a paper by Mr. A. K. Sweet, of Boston, on "Styles and Sizes of Machine Tools." This paper aroused great interest, and was followed by discussion. At 12 o'clock the annual dinner was enjoyed at the hotel.

President Turner called the afternoon meeting to order, and, after reading a letter from Mr. Davis, of Providence, inviting the association to meet there for the spring meeting, Messrs. Bridgham, of Brookline, Smith, of New Haven, and Hitchcock, of Meriden, were elected to associate membership; Mr. E. R. Markham, of Springfield, was elected to active membership. This was followed by the election of officers for the year 1901–1902, which resulted as follows: president, C. A. Davis, Providence; vice-president, E. P. Hutchinson, Brookline; secretary and treasurer, F. E. Mathewson, Springfield. Mr. Markham, of Springfield, then read a very interesting paper on "Hardening and Tempering Steel."

It was voted that all papers read at this meeting and at previous meetings should be printed and copies distributed to the members. It was also voted that, as far as possible, the expense of printing these should be met by inserting in the pamphlet several pages of advertising. If necessary, an assessment not exceeding $2 per member should be made to help defray this expense.—F. E. MATHEWSON.

BREVITIES.

THE ninth annual meeting of the Western Drawing Teachers' Association will be held at Minneapolis, Minn., May 7, 8, and 9, 1902. The exhibit committee has issued a circular urging members to show their interest by sending exhibits. The circular also points out the fact that the exhibits have become a very important feature of these annual gatherings. "It is hoped that this year there will be a showing of industrial and manual-training work as well as drawing."

THE National Educational Association will hold its forty-first annual convention in Minneapolis, Minn., July 2 to 11, 1902. President W. M. Beardshear is planning an attractive program for the general sessions, and the local committees are doing their best to offer the members of the association an opportunity to see the best there is in the great Northwest. The president of the Department of Manual Training, Professor Charles R. Richards, of Teachers College, New York city, is at work on a program that bids fair to be a particularly helpful one. One of the sessions of this department will be a joint session with the Department of Art Education. The topic for discussion in this will be, "How May the Co-operation of Art and Manual-Training Instruction Be Secured?" The general subject which will be discussed in the second, or manual-training, session is, "Should the Character of Shopwork Instruction in the Elementary School be Broadened?" Professor Richards will no doubt secure men who can discuss the topics from a high point of view. With the present interest in manual training throughout the Northwest, and the conditions so favorable, there is every reason to believe that the department will score the greatest success in its history in its meetings this year.

THE Eastern Manual Training Association will hold its annual meeting in Allegheny, Pa., July 1 and 2. The president, Mr. Daniel Upton, supervisor of manual

training in Buffalo, promises a "live lot of subjects and speakers to match." The local committee is arranging for visits to many of the great industrial plants centered about Pittsburg. The American Association for the Advancement of Science and Affiliated Associations, also the Pennsylvania State Teachers' Association, meet in Pittsburg during the same week.

PROFESSOR JOHN DEWEY will be at the University of Chicago during the first term of the summer quarter and will give a course in educational psychology. This will begin June 18 and continue six weeks. Dr. Moore will continue the work in psychology during the second term. Professor Locke will give a course in the history of educational theory and practice during the first term. During the second term Professor Butler will give a course in comparative school systems. In the School of Education Dr. Duncan will give two courses in drawing and painting. Miss Mitchell will give a course in basketry and weaving, and Miss Butler and Miss Langley will give courses in woodworking.

THE summer session at Columbia University, New York city, will open July 7 and will continue till August 15. Several of the courses offered will be given by members of the Teachers College faculty. Among these are two in manual training. Miss Weiser will give a course for the lower grades, including cordwork, raffia and reed basketry, paper and cardboard work, bent-iron work, elementary woodworking, and simple weaving. Mr. Eklöf will give a course in woodworking for elementary schools. The object of these courses, as stated in the announcement, is to provide opportunities, first, for teachers of this subject to make a study of courses and methods represented at Teachers College; second, for superintendents and principals of schools and teachers in other fields to acquaint themselves with the methods and practice of manual training; and, third, for regular students, or those intending to become regular students, in the manual-training department of Teachers College to gain additional facilities for work.

THE Teachers' Training College of the German Association for Manual Instruction at Leipzig has issued an attractive announcement for the summer of 1902. Courses are offered in elementary work, cardboard work, joiners' work, woodwork for country schools, wood-carving, modeling, metalworking, and glasswork. Copies of the announcement can be obtained in this country by addressing Charles A. Bennett, Bradley Polytechnic Institute, Peoria, Ill.

THE University of Illinois is to offer a summer course in manual training, and has secured as instructor for this course Supervisor William E. Roberts, of Cleveland, O. This indicates commendable wisdom on the part of the university, and is at the same time a compliment to Mr. Roberts. Mr. Roberts is sure to give just the kind of a summer course that is so much needed in the Mississippi valley. According to the announcement sent out by the university, the course will consist of lectures and discussions of principles, methods, courses, and equipments, and daily practice in woodworking. The shopwork will be adapted to the needs of teachers in the grammar grades and the first year of the high school.

MR. LUTHER W. TURNER, instructor in manual training at the Worcester Academy, is to be in charge of the manual training this year at the Martha's Vineyard Summer Institute. Courses in woodworking especially adapted to the needs of upper grammar and high-school grades will be given. Mr. Turner has had more than ten years of

shop experience, and will therefore be able to give thorough instruction in the manipulation of tools.

THE Chicago Sloyd School has decided to hold a summer session. Miss Anna Murray, the director of the school, will give a course for teachers. Miss Murray has been a student in the Technical School at Stockholm, Sweden, and in the Sloyd Training School at Nääs. For six years she was associated with Miss Meri Toppelius.

THE Kindergarten Training School of Grand Rapids, Mich., offers summer courses in manual training and domestic science under the direction of Mr. George S. Waite, supervisor of manual training in the Grand Rapids public schools. Opportunity will be given for specialization in benchwork in wood, knifework, cooking, sewing, or reed and raffia weaving, and elementary construction work. Work will begin July 7 and close August 30.

THE Eastern Manual Training Association is doing a generous service to education by printing and distributing copies of its proceedings. Persons not members of the association can obtain copies of the proceedings of the Buffalo meeting by sending five cents for postage and mailing expenses to William E. Roberts, 464 Rose Building, Cleveland, O., or to the secretary of the association, Mr. C. B. Connelley, Third and James streets, Allegheny, Pa. The volume contains papers by Colonel Francis W. Parker; Superintendent Charles B. Gilbert, of Rochester; Superintendent H. P. Emerson, of Buffalo; Supervisor Fred. W. Smedley, of Chicago; Principal William I. Crane, of Dayton; Elbert Hubbard, of East Aurora; Professor Charles R. Richards, of New York; George A. Robbins, of Quincy; Mrs. Nellie Kedzie Jones, formerly of Peoria; and Mrs. Lisbeth M. Gladfelter, of St. Louis. Not the least interesting and helpful part of the volume is an abstract of the stenographer's report of the discussions.

THE City and Borough School Superintendents' Association of Pennsylvania, at a meeting held in Johnstown a short time ago, recommended the introduction of manual training and domestic science into the public schools of the state.

THE students of the West Side High School of Milwaukee have accomplished a remarkable piece of work in the manual-training department, under the direction of Mr. Wilde and Mr. Olaf G. Peterson. There was need of remodeling the workroom, but the amount of money necessary, $1,200, was not available for that purpose. The teachers and students undertook the work, and completed it in two months at an expense of only $200.—*Wisconsin Journal of Education.*

PROFESSOR F. F. FREDERICK, of the department of art and design at the University of Illinois, has been granted a leave of absence for a year to study in Europe. He intends to go directly to Plymouth and settle in Penzance or St. Ives, where he will paint till the middle of September. Then he will go to London to study the work of the Technical Education Board of the London County Council and to work in some of the classes for journeymen and apprentices in the art-crafts. The spring months he will spend in Paris.

MRS. IDA HOOD CLARK, supervisor of manual training in the east side schools of Saginaw, Mich., has gone to Nashville, Tenn., to supervise the manual-training work of the first six grades in the public schools of that city. Mrs. Clark has made many friends in Michigan during the past two years, who regret her departure, but wish her joy and an equal measure of success in the South.

THE Philadelphia manual-training schools have steadily grown within the last ten or twelve years in point of numbers and usefulness, until in last June a majority of the students graduated by the grammar schools elected the course in the manual-training schools — a condition which until the present year did not exist. This shows in a very striking manner that the people of the city have become cognizant of the rôle which manual-training schools are to play in the educational system of our country in the near future. — Germantown *Telegraph*.

THE St. Louis World's Fair in 1903 will be the first of the great international expositions to provide a separate building for educational exhibits. Here will be collected under one roof a comparative display of the educational systems and educational agencies from all the leading nations of the world. To take charge of this display the management has appointed Mr. Howard J. Rogers, who was in charge of the American educational exhibit at the Paris Exposition in 1900. The educational exhibit will contain eight groups, as follows: (1) elementary education; (2) secondary education; (3) higher education; (4) special education in fine arts; (5) special education in agriculture; (6) special education in commerce and industry; (7) education of defectives; (8) special forms of education — text-books, furniture, school appliances. A pamphlet has been issued giving considerable data concerning the plan and scope of the exhibit. In the pamphlet is the following paragraph: "Manual training will form one of the most important parts of the exhibit of pupils' work. As distinguished from industrial and technical training, manual training has made great progress in the schools of the United States during the last ten years, and a comprehensive and typical exhibit will be prepared under the supervision of an expert."

THE enrolment in the Denver Manual Training High School is 511 — 259 boys and 252 girls. The following new teachers have been added: Mr. C. V. Kirby, wood-carving, modeling, and design; Mr. J. W. Mahin, physical geography and botany; Mr. W. R. Rhodes, history; Miss Sarah Stinson, wood-carving, modeling, and design; Miss Ethelyn Price, English; Miss Isabelle White, modern languages. Miss Margaret Packard, teacher of modern languages, has been granted leave of absence for one year.

BOSTON.

THE monthly meetings of the Boston Manual Training Club this year have been unusually interesting. The topics have been as follows:

September — "Manual Training in Springfield, Mass., and in Summer Camps," John C. Brodhead, of the Prince School.

October — "Bulgaria, Its Schools and People," Rev. W. P. Clarke, returned missionary. A very interesting collection of Bulgarian articles was on exhibition.

November — "Experiences as a Teacher," C. W. Parmenter, head-master of the Mechanic Arts High School.

December — "Summer Experiences and Summer-School Work," Frank Carter, of the Prescott School.

January — "Summer-School Work in South Boston," Joseph Sandberg, of the Sloyd Training School; and "Manual Training in a Regular High School," Edward C. Emerson, of the Winship School.

February — Reading of a letter from C. T. Work on "Manual Training in San Francisco," with discussion.

March — The club, with friends and some advanced pupils, visited, on invitation,

the Zore River Iron Works, and spent an enjoyable afternoon seeing some of the heaviest machinery in this country in operation.

April — At the Winship School, Brighton, a debate. Subject: "*Resolved*, That the manual-training teacher's highest rôle is that of counselor, not only as to materials and method, but also in the selection of projects." Affirmative, Edward C. Emerson; negative, George C. Houghton.

During the Christmas vacation the club gave a dinner to Mr. J. H. Trybom, one of its charter members, now director of manual training in Detroit. There were about forty present. The speakers were Professor Hanus, of Harvard; Mr. Frank M. Leavitt, principal of manual training in Boston; Head-Master T. A. Tupper of the Brighton high school; Head-Master A. D. Small of the South Boston high school; Head-Master G. C. Mann of the West Roxbury high school; and Mr. Trybom. Mr. J. C. Brodhead was toastmaster. Among those present were directors and teachers of manual training from New Bedford, Woonsocket, Lynn, Medford, Malden, Lowell, Natick, and Milton. The menu was appropriately printed on figured whitewood about one thirty-secondth of an inch in thickness.

On January 4 Henry T. Bailey, agent of the state board of education, gave a lecture before the Massachusetts Industrial Art Association on "More Artistic Manual Training." The feeling among manual-training teachers seems to be that, while his lecture was very suggestive, a conference with workers would be more productive of results.

The manual-training room has been opened at the Lewis School, with Dr. Ella G. Smith in charge. A yard building for manual training has been erected at the Dudley School, and is awaiting an instructor. Miss Grace K. Peaslee, now in charge of the work in Taunton, has been offered the position, and may accept.

The report of the manual-training committee of the school committee was issued recently. It contains, besides statistics, photographs of the work in cardboard in the fourth, fifth, and sixth grades, and photographs, working drawings and exercises of the wood-working course used in the seventh, eighth, and ninth grades. Photographs also appear of the work of the Mechanic Arts High School, all departments. A limited number can be had by application to the secretary. The 1902 manual of the school committee shows thirty-two woodworking rooms and thirty instructors of grammar-grade work.

The director of manual training in Milton, Mr. C. W. Hunt, is introducing, experimentally, raffia work in the lower grades. If successful, the work will be extended another year.

Through Mr. Gustaf Larsson we learn that the outlook for sloyd in Cuba is very encouraging. The commissioner of public instruction in Cuba, Mr. Hanna, has asked whether the Sloyd Training School would be willing to train six Cuban teachers every year. The school has promised to take three. Mr. Hanna feels sure that in order to make the work successful there must be native teachers employed. Already three native teachers trained at this school are teaching sloyd in different parts of Cuba.

The House of Refuge, Randall's Island, N. Y., has introduced sloyd, believing that it is one of the best means for reforming boys. A course of work for beginners especially adapted for that place has been suggested for this school. — John C. Brodhead.

NEW YORK CITY.

DEAN RUSSELL of Teachers College sailed for Porto Rico March 8. He was to spend two weeks on the island, inspecting schools and conferring with the authorities concerning the establishment of industrial schools and the introduction of manual training.—*The School Journal.*

MR. CHARLES MENTZEL has recently been added to the corps of shopwork instructors in the boroughs of Manhattan and the Bronx, having temporary charge of the work so successfully carried on for some years by Mr. T. Harry Knox in Public School No. 43. Mr. Knox has taken up work in another department of the school.

A MEETING in the interests of Hampton and Tuskegee Institutes was held at Carnegie Hall on Wednesday evening, March 10. Bishop Potter, of New York, presided, the other speakers being Booker T. Washington, principal of Tuskegee Institute; H. B. Frissell, principal of Hampton Institute; and R. C. Ogden, president of the Hampton board of trustees. It was stated that $100,000 a year was required to maintain the work at Tuskegee, and $80,000 at Hampton. The speakers strongly urged the value of industrial education as a factor in the solution of the negro problem.

NEW JERSEY.

IN Newark another step has been taken toward making the work in manual training continuous from the kindergarten through the high school. Six schools were selected in February, in each of which a simple equipment has been installed for carrying on work in paper-folding, cardboard construction, weaving, raffia work, and basketry. This work bridges the gap between the kindergarten and the fifth school year, in which knifework begins. It is expected to increase the number of schools in which the primary manual training is required, till all the schools are included. The teachers in the primary schools are quite alive to the value of manual training for their classes, as is shown by the fact that the director of manual training, Mr. Eli Pickwick, Jr., desirous of starting a volunteer after-school class in the subject, received over a hundred and fifty applications.

A class of forty enthusiastic teachers has been formed to meet Mondays after school. These teachers in turn are giving the work to small groups of interested teachers at the several schools from which they come.

GEORGIA.

THE schools of Columbus have within the past two years added to the ordinary common-school curriculum a course in manual training, embracing clay-modeling, paper-folding and cutting, cardboard construction, knifework in thin wood, carpentry, plain sewing, and cooking. All children of the elementary schools, white and black, are given some form of hand-training. In the high school, commercial studies, such as typewriting, stenography, bookkeeping, and economics, have been added as optional studies, with the hope of giving pupils some acquaintance with commercial life and preparing them to take more profitably their place in the commercial world, if they elect to enter it.

As a recent development of the schools a primary industrial school has been established as near the center of the working people's community as it was possible to locate it. The desirability of such a school has been felt for some time.

The equipment for this school is given by Mr. George Foster Peabody, of New

York. Mr. Peabody spent his early boyhood in Columbus, and has shown himself to be a warm friend of the place.—C. B. GIBSON, in *Enquirer-Sun*.

OHIO.

AT a recent meeting of the Present Day Club at Dayton the subject of "Arts and Crafts" was under discussion, and a splendid paper by Mr. Brainard Thresher was presented. The local manual-training school came in for considerable praise. In fact, the meeting was practically turned into an enthusiastic manual-training meeting, as the two subjects go well in hand together. The result of the meeting is that an arts and crafts club has been organized in the city, and among the first things to be done is to have a large exhibit at an early date.

A CLASS of about seventy of the grade teachers of the district schools is receiving instructions in clay-modeling and cardboard construction at the Dayton Manual Training School. This is entirely voluntary on the part of the teachers and goes to show the attitude of the progressive teacher toward modern methods.

SUPERVISOR W. E. ROBERTS, of Cleveland, reports a steady increase in the interest in manual training in that city. "Knifework and sewing have been extended recently to the fifth and sixth grades in three more of the largest schools, making in all eighteen buildings where the work is taught." Two new teachers have been added to the corps of elementary instructors — Mr. A. C. Tuttle, who is in charge of woodwork and drawing, and Mrs. Sophia Denison, who is in charge of cooking in the Meyer and the Charter Oak Schools. These two schools are the two new buildings especially built and equipped as centers for seventh- and eighth-grade work. They have a capacity of from twelve to fourteen hundred boys and girls per week, though not entirely filled at present. These schools are attracting much favorable comment and are a credit to Supervisor Roberts and the city of Cleveland.

MR. GEORGE S. COLBURN has resigned his position in Cleveland to accept a more lucrative offer in the Rochester Athenæum, Rochester, N. Y.

THE Cincinnati Technical School is now a part of the University of Cincinnati and is quartered in a new and up-to-date building on the university grounds. The building is 243 × 50 feet and is divided into three parts, the central part being two stories high. The scope of the school will be the same as formerly when located in Central Music Hall, but with the new equipment and facilities it will do more for the engineering students of the university than ever before. The main object of the school, however, remains the same as when organized fifteen years ago by several public-spirited gentlemen of Cincinnati, who appreciated the value of manual training. Messrs. Promberger and Shipley, of the old corps of instructors, remain. C. W. Marx is director.—E. A. BENDING.

INDIANA.

THE Indianapolis Manual Training High School is crowded to its utmost capacity, and Superintendent Emmerich is making strenuous efforts to have an addition built on their available ground. The September promotions from the grammar grades showed 320 entering the manual-training high school, whereas only 80 entered the regular high school. Superintendent Emmerich is to be congratulated on the excellent work that is being done as well as the skilful organization which permits some 1,300 students to enjoy the benefits of the school.

SUPERVISOR W. S. HISER has been experimenting with weaving in the lower grades of Richmond, with excellent results. Hand looms are made as an exercise in the woodworking department, and these are distributed among the different schools for use. Work in cardboard, colored paper, and raffia has been carried to a high degree of excellence.

The newly and excellently equipped woodworking department has begun to show good results and is meeting with more than general favor on the part of the public.—E. A. BENDING.

WASHINGTON, D. C.

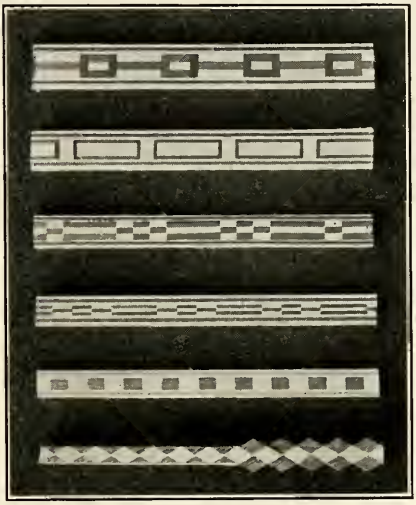
THE manual and other work heretofore conducted as the technical courses of the white and colored high schools has been reorganized and extended, and has now an independent existence, although still in old quarters. The completion of the new buildings and the installation of their equipments have been so much delayed that neither is likely to be occupied until the opening of the next school year.

The schools are at present designated Manual Training School No. 1 and Manual Training School No. 2, respectively. The former has an enrolment of 251 pupils, with sixteen teachers. Mr. A. I. Gardner, heretofore head of the manual-training department of the Central High School, is principal. The teaching corps was largely made up by transfers from the local high schools, the teachers coming out with the pupils, as it were. In English and history are Mr. J. P. Gerry and Miss C. Christiansen; in mathematics, Mr. J. D. Minnick and Miss F. Sanders; in modern languages, Miss W. C. Hartman; in chemistry, Mr. L. W. Mattern; in mechanical drawing, Mr. R. B. Hayes. The shop instructors remain as heretofore — Mr. F. E. Skinner and Mr. H. R. Thompson in metalworking, Mr. H. B. White in woodworking. The domestic-science departments are in charge of Miss M. White and Miss H. Draney, who for several years have been in similar positions in grammar-school work. In freehand drawing and design are Mr. Forest Grant and Miss F. M. Layton. The former, after a successful experience as a grammar-school teacher and principal, supplemented his training by courses at the Chicago Art Institute and at Pratt Institute. Miss Layton, also a teacher of experience, is a graduate of the Pratt Institute course in design. Mr. C. M. Hall, in charge of the department of physics, is a graduate of the Worcester Polytechnic Institute, in the regular and post-graduate courses in electrical engineering, and has had several years' experience. As a body, these teachers give promise of being able to secure to the pupils coming to them the full benefits which a school of this kind should bestow. They are of proved ability as inspiring teachers in their various subjects, are awake to the possibilities before them, and are enthusiastic students of the problems involved.

The courses of study are designed to prepare for scientific and engineering colleges, for the local normal school, and for immediate participation in the work of the world. To the established course, which was modeled on familiar lines, have been added a four-year course without other language than English, and a two-year course. The former permits the emphasizing of shopwork, drawing, and science, while the latter is intended for those wishing to condense within the briefest practicable time the largest amount of the more useful branches consistent with a fairly comprehensive education.

In a subsequent number of this MAGAZINE the plans for School No. 2, for colored pupils, will be noted.— J. A. CHAMBERLAIN.

THE cut for the accompanying illustration of inlaid borders is used here by permission of the *Pratt Institute Monthly.* In that magazine it was used in an article on "Woodwork in the High School." In this article, for which credit is due to Mr. Albert B. Green, is the following description of the process of making these inlays, changed only in minor details, owing to its separation from the rest of the article:



The stock for the border this year was white holly and ebony veneers $\frac{1}{8}$, $\frac{1}{32}$, and $\frac{1}{64}$ of an inch in thickness, and the designs are produced by gluing these together in the different combinations, several of which are shown in the illustration. Pupils combine in gluing up enough material for all to use in their borders. Working in this way, the time consumed is small—probably less than ten minutes for each pupil—and the whole time devoted to working up the design and mortising it into the box does not add to the total given to the model in anything like the proportion that would be supposed.

Referring to the second border shown, one of the pupils would take a piece of $\frac{1}{8}$-inch white holly veneer, 3 inches wide and 18 inches long, and glue on either side of it a piece of $\frac{1}{32}$-inch ebony veneer, of the same dimensions. The next day, when this was dry, another pupil would saw off in the miter-box a number of pieces 3 inches wide and $\frac{5}{8}$ of an inch long. A third pupil would saw the same number of pieces 3 inches wide and $\frac{3}{16}$ of an inch long. A fourth pupil would smooth the sawed edges slightly by rubbing them over a block, on which had been glued a piece of fine sandpaper. A fifth pupil would rub these pieces together with a small amount of glue on each end, as shown in the illustration. Three strips of $\frac{1}{32}$-inch veneer would then be glued together, in this order: first, a strip of white holly, then a strip of ebony, then another strip of holly, as shown in the illustration. The whole would be clamped between smoothly faced blocks and put away. We now have a glued block 3 inches wide, 18 inches long, and $\frac{3}{8}$ of an inch thick. This is cut on the circular saw into strips $\frac{1}{8}$ of an inch wide, giving us the pattern for the border ready to inlay; so that the smallest piece which the pupil handles, when he comes to mortise it into the box, is $\frac{1}{8}$ inch thick and $\frac{3}{8}$ wide, with a length a trifle less than the width of his box, and in no case does he handle a piece less than 3 inches long.

The central decoration of a box cover is built up in much the same way. The pupils take one or more pieces of $\frac{1}{8}$-inch fancy wood and build around it their design, using some of the various borders that have been built by the different members of the class in the way described. Then the whole is mortised in the cover as a single piece.

CHICAGO.

MANUAL training is receiving much attention from the principals and teachers of the Chicago high schools. It was discussed at two meetings of high-school instructors during January. The first was a meeting of the High School Council, made up of the principal and two teachers from each high school, where the question, "Shall Manual Training Be Made a Part of the Regular High-School Work?" was discussed.

It was agreed without a dissenting voice that manual training should be generally adopted, and the only diversity was as to how much should be given, and how much credit should be allowed.

Later in the month manual training was made the subject for discussion at the regular monthly meeting of the Cook County High School Association, of which Superintendent Cooley is president. Two very able papers were presented, one by Miss Carolyn Parrish, of the Lake View High School, who laid particular emphasis on the educational value of handwork; and the other by Mr. Hill, of the Hyde Park High School, who called attention to the industrial and ethical sides of the question.

The remarkable feature of both of these papers was that the writers were neither of them engaged in manual-training work. Miss Parrish is a teacher of Latin, and Mr. Hill of political economy, but the most enthusiastic friend of manual training could have added nothing to their remarks. The sentiments of the papers were indorsed by those present, most of whom are teachers in ordinary high schools.—GRANT BEEBE.

CALIFORNIA.

MR. ALBERT L. OLSON, formerly supervisor of manual training in San Diego, Calif., passed away on the 10th of January last. Mr. Olson gave great promise of future usefulness in his chosen profession, and was doing much for the cause in which he labored. His untimely death takes from us a strong teacher and a noble man. His successor has not yet been elected.

THE death of Mrs. C. C. Bradfield robs Los Angeles of its supervisor of drawing. She has seen twenty years of service in that city, and has watched closely the development of the graphic art in the schools. At the time of her death she was endeavoring to bring about even a closer relationship than now exists between the drawing and constructive work. Her former assistant, Miss Louise M. Hutchinson, will carry on the work in the grades, while Miss Fannie Mitchell has been brought from Pomona, Calif., to take up the high-school work.

AT the territorial Normal School, Silver City, N. M., manual training has been entered as regular course work under the general direction of Professor H. A. Owen. Miss Jane Langley has charge of the training department of the school, and the attempt is being made to correlate from the kindergarten through the upper grades. Here the clay and paper work receive much attention, while drawing precedes all construction.

SATURDAY classes in benchwork have been instituted at Pomona, with Miss Ada Brooks, of Pasadena, in charge. A simple, although an exceedingly good, equipment has been purchased, and the work is carried on at private expense. It is expected that the public-school authorities will purchase the equipment next year and place manual training in the grades.

MRS. GRACE C. DUTTON, director of domestic economy at Throop Polytechnic

Institute, is giving a series of demonstration lectures throughout the southern portion of the state. Much interest is manifested on the part of women's organizations.

AT the San Francisco state normal school the sloyd work has been gradually displaced by other forms of handicraft. Mr. Kenyon still believes in the sloyd for large city systems, where the school régime is of necessity formal. But he thinks there are better things in manual training for special institutions, where the children come individually into a close personal relation with the teacher. He frequently has as many as seven kinds of work going on at a time, not for variety's sake, as he says, but because the individual interests of the pupils and the exigencies of correlation bring this condition about. While one boy is turning an Indian club, another is modeling a putty map, and a third is translating a half-tone into a clay relief. Others are making plaster casts, or perhaps have joined the girls in basket-making. Still others are engaged on various pieces of woodwork. Mr. Kenyon speaks of "projects" instead of "models," evidently making a fundamental distinction between work which courts the pupil's initiative and that which, to his mind, discourages it.

The student teachers at the above school pursue a similarly elastic line of work Their undertakings are all "projects," and it is the aim to give them a Jack-at-all-trades sort of self-helpfulness rather than an abortive initiation into a system which Mr. Kenyon thinks they will never use.

THE Cogswell Polytechnic College of San Francisco under its new management is likely to become one of the foremost institutions of its kind. After the death of the former president, Dr. Henry D. Cogswell, something over a year ago, the school was carried on most acceptably by Mr. A. A. Macurda, who is now engaged as educational director of the San Francisco Y. M. C. A. In calling the new president, Professor Barton Cruikshank, a man of wide experience is secured, who is entirely changing the old form of school government.

President Cruikshank is a member of the American Society of Mechanical Engineers, and has held, among other positions, that of first assistant mechanical engineer, having to do with the installation of the million-and-a-quarter-dollar superheated water plant of the Boston Heating Co.; superintendent of the Brady Manufacturing Co., New York.; and consulting engineer for the East Tennessee Rolling Mills. On the scholastic side President Cruikshank has been engaged as instructor in graphics, mathematics, and engineering at Princeton University; was head of the department of graphics and shopwork at the manual-training high school of Brooklyn, and president of the Clarkson School of Technology, Potsdam, N. Y.

Students who have completed the regular grammar-school course are admitted to the college. The courses are three years in length and cover the subjects of steam engineering, surveying, mechanical arts, drafting, domestic science, and art. The graduates of these courses may pursue an additional one-year course in normal manual training or domestic science or a trade course.—ARTHUR H. CHAMBERLAIN.

IOWA.

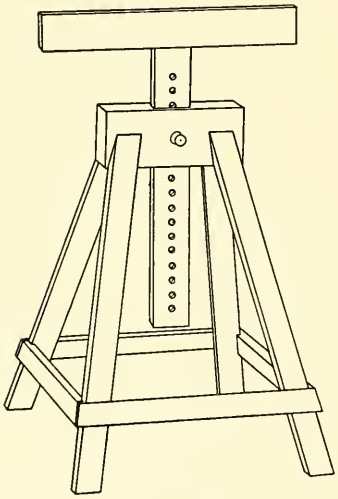
AT the meeting of the Iowa Teachers' Association, held during the holidays, manual training was discussed at some length in the general session and also in several of the department "round tables." In the high-school section Mr. A. W. Brett, of Des Moines, read a paper strongly advocating trade instruction in the public schools. The arguments Mr. Brett used in support of his position were that public schools should prepare boys and girls for life in the industrial world, since so

large a proportion of them enter that field. He also said that the schools should give the pupils practical work which would bring money to help them through school. Mr. A. C. Newell, supervisor of manual training at Des Moines, opposed the idea of trade instruction in public schools on the ground that manual training supplies the needs of pupils better than trade instruction, and is very much less expensive. The resolutions passed at the close of the meeting favored manual training, but opposed trade instruction in the public schools.

THE city of Ackley, Ia., has recently introduced manual training, and reports very great enthusiasm and good results. Several of the smaller cities of Iowa are considering the feasibility of introducing manual training soon.

NEXT year additional teaching force will be employed in West Des Moines, and manual training will be introduced into all the grades which do not have the work at present. It is expected also that manual training will be begun next year in the North High School, the other high school of the district. A new $150,000 addition is being built to the West Des Moines High School, and the manual-training department will be considerably enlarged when the building is completed. Mr. A. C. Newell, the supervisor of West Des Moines, expects to spend the coming summer in Europe traveling and studying the manual-training systems there.

DRAWING-BOARD EASEL.



THE inexpensive drawing-board easel shown in the accompanying drawing has been such a convenient and altogether satisfactory piece of furniture at Bradley Polytechnic Institute during the past three years that we wish to commend it to others. It needs no description; its use is evident. It is far more convenient for school work in freehand drawing than a tall easel, a drawing stand, or a bench. Made of oak and well finished it becomes a durable piece of furniture.

This easel was designed at the University of Illinois about fifteen years ago, and has been in use there ever since. Professor Frederick has added to some of his easels a rabbeted piece just above the pin, this piece being so fastened as to form a groove in which to rest a board or a portfolio in a nearly vertical position.

MINNESOTA.

AN interesting conference on "Industrial Education" was held early in the summer at the opening of the summer school at the University of Minnesota.

Mr. J. J. Flather, professor of mechanical engineering at the university, was chairman of the conference and delivered an address on manual training, in which it was clearly demonstrated that manual-training courses could be added to any existing high school without detriment to the latter, and without curtailing a single subject.

It was shown that the pupil's interest and enthusiasm in drawing and manual training extended beyond the mere work of the mannual-training course, and as a result his work in the sciences and mathematics was benefited. His zeal was stimulated, and in those schools in which manual training had been carried on for some time it was found that the percentage of those who pursue the course to the end had been very materially increased. Moreover, of those who graduated from manual-training high schools a very much larger percentage passed on to the higher technical schools and colleges than was found to be the case with the ordinary English high school.

There seemed to be an impression, the speaker said, that a manual-training school was designed solely and specifically to teach a boy a trade, and that his general culture and other studies must be entirely neglected; that is, if you send a boy to a manual-training school, the result will be a mechanic instead of an educated boy. Teachers were partly responsible for this, and they should make an effort to correct this impression. As a matter of fact, it is impossible to turn out mechanics from manual-training high schools, for these are made in the shops; but it is possible to turn out educated boys, with hand and eye trained and developed to a much higher degree than is possible by the ordinary methods of education. As Mr. Woodward puts it, "The object should be to train the whole boy, and not merely his head," and this is best accomplished by the introduction of manual-training courses into our existing high schools.

Among other papers presented was one by Dr. Henry T. Eddy, also of the University of Minnesota, who gave a review of the "Present Status of Industrial Education in the United States," this being a résumé of the report of the Committee on Industrial Education appointed by the Society for the Promotion of Engineering Education.

Dr. Eddy showed that we were just at the present time in a state of development, and what would be the outcome could not be predicted; but it was probable that the restrictions with which the labor unions have hedged the various trades will lead to the establishment of trade schools of some form or other; and this may be expected to constitute a permanent part of the educational system of the future.

These schools are not, in any sense, manual-training high schools, in which a high-school education is obtained together with certain work along the line of manual training; but the object of the trade school will be to turn out a trained artisan and to give him, at the same time, a good grammar-school education, with possibly such other studies as may be found profitable or necessary for the prosecution of his peculiar trade.

Both the papers of Professor Flather and Dr. Eddy were discussed by eminent educators and practical men — employers of labor — who were very emphatic in their beliefs that industrial education or manual training did develop the boy; and the statement was made that skilled mechanics of the future must be drawn largely from the graduates of manual-training or trade schools.

"The Teaching of Chemistry and its Relation to Industries" was very ably presented by Dr. George B. Frankforter. Principal Charles A. Smith, of Duluth, discussed "Commercial Education in High-School Courses," citing his own experience in Duluth and elsewhere. The consensus of opinion, as developed by the discussion which followed, seemed to indicate that commercial education was not only desirable, but a necessity in our present educational system.

Mr. John C. Billings, of the East High School, Minneapolis, presented "A Brief

Course in Manual Training for High Schools." This was freely discussed by a number of educators and others, and the point was brought out that there was a difference between manual-training courses in the high-school and manual-training courses for colleges and technical schools. In the latter the aim was to develop and train engineers, and from the very start this object is held in view in the various exercises presented, whereas in the high-school courses the object is to develop the hand and eye, and teach habits of observation and methods of precision without any definite relation to his future vocation. To this end the exercises are drawn from a variety of sources, the aim being largely to interest the boy in the work in hand. For this reason we find in high-school courses that working exercises, for the sake of exercises, have been practically eliminated, and that everyday objects and useful articles have been substituted for the mere exercises. This not only interests the boy, but nearly always interests the parents, and is often the means of keeping the boy at school until the completion of his course.

Mrs. Margaret Blair, of the Minnesota Agricultural School, and other teachers interested in the industrial education of girls, gave interesting talks as to methods and results obtained.

The conference was very satisfactory from every point of view, and some results have already been shown, if we can judge from the interest manifested in manual-training and industrial education throughout the state. Several high schools have made a beginning this year, prominent among which is the Faribault high school. It is the intention of the board at Faribault to extend the work to the seventh and eighth grades this year, if possible, and gradually work downward to the lower grades. We understand that the department will be kept open during the summer, so as to allow boys to keep busy and gain time on their courses. Mr. J. R. McKnight, of Omaha, has been appointed as director of the work.

AT the annual meeting of the Minnesota Educational Association of St. Paul, in December, the primary and high-school sections each devoted an entire session to the discussion of various phases of manual training, and all the general sessions were permeated through and through with the manual-training idea. I could not help contrasting the sentiment with that of five or six years ago, when it was almost or quite impossible for the advocates of manual training to get a hearing in our association.—J. E. PAINTER.

THOSE who know the inside history of the Mechanic Arts High School in St. Paul, Minn., will rejoice when they learn of some of the facts presented by the St. Paul *Globe* in an editorial a short time ago. This editorial gives a correct general impression, at least, when it says:

The Mechanic Arts High School has long been the football of hostile attack. Time was when it was abolished regularly every six months. And yet it grew and flourished like the historic bay tree. It was evidently one of those good things that you can't keep down. In September, 1895, it had 150 students; by September, 1898, the number had increased to 260; and this fall it began with 445 students, showing an increase of 17 per cent. over last year, while the Central High School gained only seven students, or less than 1 per cent. An institution that contains such elements of growth and progress cannot be kept down, and to hamper it from a mistaken sense of economy would be most severely condemned on the part of the public.

EDITORIAL.

In the death of Colonel Francis W. Parker the educational world has lost a great leader, and teachers of manual training have lost a friend and champion. As an educational leader and reformer, Colonel Parker will be remembered as a liberator of childhood from what he so often called the "tyranny" of the school. He believed that education should "set the human spirit free," and as one important means to this end he advocated manual training. Indeed, he went so far as to say that "manual training is the most important factor in primary education."[1]

In our meetings of manual-training teachers Colonel Parker was always a great thought-stimulating and thought-directing force. Whether one's ideas agreed with the colonel's statements or not, one always went away to think more sanely on the subject than ever before. In a much greater degree than some of us have appreciated, Colonel Parker has been a wise counselor, directing us away from the dead formalism of crystallized courses toward handwork that is always changing and always full of living vital interest to children.

Colonel Parker died suddenly on March 2 at Pass Christian, Miss., where he was seeking renewal of his health which had been severely strained by overwork during the weeks previous. The plans had just been completed and the contracts awarded for a part of the buildings for the School of Education, to be located on the Midway. Upon the plans for these buildings Colonel Parker had put a great amount of study, for it represented to him the greatest opportunity of his lifetime. All his long-cherished desires were to be fulfilled there. Several times, when his health seemed uncertain, he expressed the fear that he might not live to see his plans fully worked out. President Harper, in the impressive funeral service held at the University of Chicago, referred to the tragedy that marked Colonel Parker's end as the greatest and saddest tragedy of his lifetime:

> Three more years and he could have died in peace, with all his efforts rewarded, his ideas formulated, himself seeing the walls of the magnificent group of buildings which are to be the outgrowth of his thinking and his work. Could anything be more sad?

[1] *Talks on Pedagogies* (E. L. Kellogg & Co.), p. 254.

Yet he has left behind him something more enduring than fine buildings and educational devices.

Professor John Dewey, in a eulogy delivered before the Senior College students, used these words:

> Colonel Parker was above all things a whole-souled man. He was one of the most complete human beings in the blending of ideas and in his enthusiasm that it has ever been my fortune to meet. His work in the field of education was that of a missionary and apostle. Like the great apostles, he was fired by intense moral enthusiasm. I have heard people who, in giving him credit for being a great educator, believed that his work was chiefly that of development of educational machinery and devices. It was in part this, of course; but, more than this, it was a work done in the faith that in giving the child the highest education possible he was accomplishing the most he could for humanity. No one before him, except possibly Horace Mann, saw that the cause of the pubilc schools and the country was really one. He was a firm believer in the idea of educational democracy.

THE most fundamental of present problems of secondary education wherein manual training is vitally concerned is a problem of organization. Are we to look foward to a rapid increase of separate and specialized manual-training and technical public high schools, or to a broadening of general high schools so as to include manual training, commercial and technical studies, the household and industrial arts? As we have expressed an opinion on this subject in an article in this issue, we will not repeat our answer here, but we take this opportunity to call special attention to Dr. Dewey's reference to this question in his discussion of "Current Problems in Secondary Education," found on pp. 161–5. We also call attention to an emphatic answer to this question contained in a single paragraph of an article on "Problems of Our Educational System," by President William DeWitt Hyde of Bowdoin College, published in a recent number of the *Forum*. President Hyde begins his article with the statement that

> Education aims to fit one for three things: (1) to earn his living by the exercise of his trained powers; (2) to support the institutions of society by intelligent appreciation of their worth; and (3) to enjoy the products of art and civilization through the cultivation of imagination and taste.

He measures the elementary school by this threefold standard, and then turns to a consideration of the secondary school:

> The organization of the high school for our three great ends demands, first, that the classical, the commercial, and the industrial high schools shall not be separated, as has been done in some cases. Separation brings a

slight gain for each institution in its chosen line of work; but it purchases this gain at the fearful cost of the premature separation of different classes of pupils before their tastes have been discovered and the range of their powers has been tested, thus defeating the highest end. It introduces and perpetuates lines of social cleavage, natural enough in the German empire, but utterly inconsistent with the genius of the American republic, and thereby misses the great social end of unification, which the public school should promote. The setting apart of classical culture as a thing by itself deprives the workers and the business-men of their share in its refinining influence. It then becomes, for those who get it, pedantic and unduly exclusive of competing modern interests.

REVIEWS.

The Cost of Food: A Study in Dietaries. By Ellen H. Richards. John Wiley & Sons, New York. 5×7½ in.; pp. 161; cloth; price, $1.—The author is a chemist, and her book is the simplest, yet most complete, work on the scientific aspect of the food question which has appeared. Food for the infant, the school child, the active youth, the youth at college, the brainworker, the traveler; for those in institutions and hospitals; food for middle life and old age—all are considered in turn in the first half of this volume, while the last part is devoted to dietaries, costing from ten cents to sixty cents per day per person.

Mrs. Richards holds that "in the interests of the race, of its mental as well as physical development, there is no subject which should occupy the attention of educators, comparable with that of food and its influence on human progress. Child-study does not yet include a study of the influence of food upon the mental as well as physical growth. It nevertheless may have more definite and direct bearing than anything else."

The facts and inferences to be drawn from careful study of this book are of the utmost concern to every thoughtful student of domestic science.

BERTHA J. SPOHR.

Light, Heat and Power in Buildings. By Alton D. Adams. William T. Comstock, 23 Warren St., New York. 7½ × 5 in.; pp. 102; price, $1.—A number of simple numerical problems illustrating the methods employed in computing the amount of light, heat, and power that can be obtained from different fuels, and a comparison of their cost for different kinds of work. The amount of energy which is lost in the different methods of heating and lighting, especially where coal is the fuel, is very clearly demonstrated.

The book will prove valuable for use as a reference book for elementary students in heating and lighting, and for others not familiar with the methods of determining the amount of power to be obtained from different fuels. The excellent selection of numerical problems and practical applications of well-known formulas, especially in the case of boilers, makes the book of interest to teachers and advanced students.

F. L. BISHOP.

An Elementary Course in Woodwork. By George Alexander Ross, instructor in woodwork and pattern-making, Lewis Institute, Chicago. A. Flanagan Co., Chicago and New York. 7¾ × 5 in.; pp. 117; illustrations, 134.—The book is designed for high and technical schools. The illustrations (photographs and mechanical drawings) are clear and easily understood. The author has been brief in his statements, but none too clear at times in the expression of his thought. These two facts may lead to a misunderstanding on the part of the reader, especially if he be a high-school boy. His tool practice is that in common use, but the course of exercises illustrated will certainly be criticised by progressive teachers of woodworking.

The course contains ten exercises — not models — and two problems. The ten exercises are in the use of tools and construction of joints. With two exceptions (one a bench hook and the other a box with a sliding top), the completed objects have no value in daily life. Very little flexibility can exist in the course, and there is practically no opportunity for the exercise of originality on the part of the student. Of the two problems one is in trusswork and the other in stair-building. These would seem to be out of place in a book designed for beginners, as too much of the technical is given for work in an elementary course, and not enough information is offered for a comprenshive treatise. F. D. CRAWSHAW.

Electromagnets. By A. N. Mansfield. D. Van Nostrand Co., New York. 6 × 3½ in.; pp. 155; price, $0.50.—This work is a very complete compilation of material on the design and construction of electromagnets for various scientific and engineering purposes.—F. D. C.

Year-Book; Council of Supervisors of the Manual Arts, 1901. Dr. James P. Haney, Secretary, Park avenue and Fifty-ninth street, New York. 8×10 in.; pp. 80; price, $3.— This is the first publication of the Council, and contains the papers read and discussed at its first annual meeting, in New Haven, Conn., December, 1901. It also contains the constitution, by-laws, and list of members of the Council. The volume is illustrated by six plates and several drawings in the text. The subjects treated are for the most part those of particular interest to supervisors of art instruction in public schools, though several of the papers should be of equal interest to teachers and supervisors of manual training. Among these is one by Henry T. Bailey, on "The Principles of Constructive Design," and another, on "Venetian Iron Work" for elementary schools, by William J. Edwards.

The following have been received:

The Educational Foundations of Trade and Industry. By Fabian Ware. No. 54 in the "International Education" series, edited by Dr. William T. Harris. D. Appleton & Co. 5×7 in.; pp. 300; price, $1.20, *net.*

Report of Committee on Manual Training, Boston, Mass.—A valuable illustrated document containing much detailed information concerning manual-training courses in the grammar schools of Boston, and a very full description of the equipment and courses in the Mechanic Arts High School. No other city in the United States publishes a manual-training report so complete as this.

Report of Board of Education, Grand Rapids, Mich.— Contains statement concerning the cost of manual training and pictures of manual-training and domestic-science equipments.

MANUAL TRAINING MAGAZINE

JULY, 1902

SOME CRITICISM OF HIGH-SCHOOL PHYSICS, AND MANUAL-TRAINING AND MECHANIC-ARTS HIGH SCHOOLS, WITH SUGGESTED CORRELATIONS.[1]

G. STANLEY HALL,
President of Clark University.

OF all the sciences that deal with the physical universe, physics, I suppose, may now be called central. In antiquity it was *the* science of nature from which many branches have sprung. It conditions perhaps man's most fundamental views about the world in which he lives. In all the history of science its chapter is perhaps the most imposing, its present growth perhaps most astounding, its applications and utilities most fruitful, its promise for the future brightest, and its disciplinary value unexcelled. Its pedagogic history too, under various names, is some two centuries old. As natural philosophy it has been for nearly three generations the chief, quite commonly the only, science taught in the high schools, in the old New England academies and seminaries. Despite its marvelous growth as a science, it seems now from some points of view well along in the stages of educational decadence. In this country at large from the year 1893–94, after the publication of the report of the Committee of Ten so strongly commending it, when 25.29 per cent. of all the secondary pupils in our public high schools were studying it, it has declined every year, until in the last commissioner's report only 19.04 per cent. of secondary students in the public and 17.59 per cent. of those in the private high schools study it at all, and much more than half of these (as 56 to 42) were girls; and probably less than 7.8 per cent. of all the boy pupils in our high schools are now studying physics. This progressive neglect or aversion to

[1] Address before the New England Association of Physics Teachers, Boston, May 24, 1902.

physics is despite the best fostering care of colleges, its high place among entrance requirements, the great ability with which it has been taught in the high schools, and the splendid new text- and reference-books the titles and characteristics of which are published in the valuable list drawn up by your committee. Everything that expert knowledge, that the authority which works from above downward, that the advocates of unity and enrichment, that the laboratories and methods, could do has been attempted. The same decline of physics is widespread among colleges, as President Eliot sadly notes in his late report, but cannot explain. Now, as this subject has been given such a prominent rôle as the typical science intended to lead to the introduction of others, this status is especially deplorable for the new education of science, and has given the advocates of Latin, English, mathematics, and modern languages — all of which have increased greatly and all the pupils in which far outnumber, if not far more than double, those of physics—grounds against the introduction of science in the high schools, which some of the Latinists, notably Bentley, have used with great effect. Something is very wrong. What is it?

I make no claims to any special knowledge of physics; but as a student of education I believe that the cause lies in the neglect and the violence done to the nature and needs of the youthful soul by the present methods and matter.

1. Boys in their teens have a veritable passion for the stories of great men, and the hero-ology of physics, which, if rightly applied, might generate a momentum of interest that would even take them through the course as laid out, should find a place. As with mechanical, so with psychic force: it must be generated over a large area, if it is to be applied intensively at a single point. Physics has its saints and martyrs and devotees, its dramatic incidents and epochs, its struggles with superstition, its glorious triumphs; and a judicious seasoning perhaps of the whole course with a few references and reports on material from this field would, I think, do much. Moreover, we see in late years more and more frequently, even in the college and university, popular and new courses on the history of mathematics, chemistry, astronomy, and biology, showing that the historic sense is awakening in these fields, and giving a present sense of achievement and progress, and nothing appeals to the young more than to feel vividly the sense of growth.

2. The half-score of text-books in physics I have glanced over seem essentially quantitative, require great exactness, and are largely devoted

to precise measurements, with too much and too early insistence on mathematics. Teachers in this field have a strong sense, often expressed in your *Proceedings*, that mathematics is the only proper language of this science. The topics are no doubt admirably chosen, their sequence the best *from a logical standpoint*, and they are such models of condensation and enrichment that it seems to the organizer and to the specialist alike almost perversion that our youth pass it by. But boys of this age want more dynamics. Like Maxwell, when a youth, they are chiefly interested in the "go" of things. Recent statistics of boys' general reading in our public libraries show that they were but little interested in much especially prepared for them, like the *Youth's Companion* and *St. Nicholas*, but that the *Scientific American* and its supplement led all the rest. The boys with aptitudes for physics want to understand how engines, machinery, perhaps especially dynamos, *work*. I have known some greatly interested in the patent reports; but everything to really appeal to them must *move*. In Germany there are many toys that might be called scientific, of which my colleague Professor Webster has an interesting and suggestive collection. Hence, too, the fascination with which in my school days we delighted in lectures and demonstrations with very crude and often home-made illustrative apparatus which a clever teacher devised and set up for us. This exactness, which involved applying mathematics, came very late in the history of physics. Even Tyndall, and more yet before his day, knew little of this and never used it in classes, but were most inspiring teachers who powerfully evoked thought, and were not affected by the modern rage to apply mathematics to the boy's brain-processes even by marking his examinations and recitations.

3. I must confess myself a convert to the dire heresy that in this, and some other, fields very much thoroughness and perfection violates the laws of youthful nature and of growth. The normal boy in the teens is essentially in the popular-science age. He wants and needs great wholes, facts in profusion, but few formulæ. He would go far to see scores and hundreds of demonstrative experiments made in physics, would like to repeat them in his own imperfect, and perhaps even clumsy, way without being bothered by equations. He is often a walking interrogation point about ether, atoms, X-rays, nature of electricity, motors of many kinds, with a native gravity of his mind toward those frontier questions where even the great masters know as little as he. He is in the questioning age, but wants only answers that are vague, brief, but above all suggestive; and in all this he is true to the

great law that the development of the individual in any line of culture tends to repeat the history of the race in that field.

4. Last, and perhaps most important of all for our purpose today, the high-school boy is a utilitarian. The age of pure science has not come, but its applications, though not logically first, precede, in the order of growth and interest, the knowledge of laws, forms, and abstractions. He would know how the trolley, how wired and wireless telegraphy, works, the steam engine, the applications of mechanics in the intricate mechanisms; almost any of even the smaller straps and buckles in the complex harnesses science has put upon natural force charm him. Physics in the field, the street, the shop, the factory; the great triumphs of engineering skill, civil, mining, mechanical, inventions in their embryo stage, processes, aërial navigation, power developed from waves, vortexes, molecules, atoms—all these things which make man's reaction to nature a wonder book; and we, in frequent conversations and copious information should arouse his imagination, for this is the organ of the heart and interest, and opens up the way for reason. The boyhood of the great makers of physics and astronomy, who have found out and opened a natural way for their own genius, is a lesson which most teachers of physics, I fear, have not enough profited by. The subject-matter of their curriculum is too condensed, too highly peptonized for healthful assimilation; and we are too prone to forget that we can only accelerate nature's way, but never short-circuit it without violence.

The influence of the college professors of physics and their text-books has in the last decade or two been a stimulus of very great value in elevating standards, but this work now, in my opinion, has been overdone, and the time has come when high-school teachers should assert their independence and make ajustments to a stage of youthful interest, of which the college professor knows little. High-school physics has problems all its own, to which its representatives should address themselves with courage, resolution, and above all with independence, or else the present decadent tendencies, more due to college control, through the undue influence of examinations and standards, than to them, will continue, and with it the scientific movement, of which it is in a sense the pioneer, will suffer still more.

I accepted the invitation to speak here today because I believe that your suggestion of closer relations between physics and manual training may open one important way out of the present condition. Such *rapproachement* would involve important modifications both in your

work and that of the manual trainers; but it is precisely, and very happily, just such modifications as would tend to this approximation as, in my judgment, are greatly needed for both physics and for manual training, although for effective and complete correlation perhaps more and harder changes would be necessary for representatives of manual training than for you.

I turn, therefore, now to the other part in this problem of co-ordination.

No one can fail to admire the recent and magnificent institutions for secondary manual training lately opened at a few favored places in this country, which it is such a joy and such a happy augury for the future to visit, where the muscles — nearly half the human body by weight, and the only organs of the will, which have done all the work that man has accomplished in the world — are trained; because physiological psychologists can almost indorse Huxley's statement, that man excels the ape in brain power no whit less than he does by the power to use his hand. The studies of the brain of Laura Bridgman and others show that those parts of the cortex which innervate the hand grow deep if it is trained to skill, and atrophy if it is unused; so that no kind of education so demonstrably develops brain as hand-training. Doing is an organ of knowing, and the education of the booklings who neglect it is unreal, formal, and superficial. Motor education has not only come to stay with the world, but every sign indicates that it commands the future, and has before it a surer and greater growth than any other field of education. Everywhere and to everything pedagogues now feel that they progress when they can add a motor element. Moreover, muscular development in the order of nature not only precedes but conditions that of mind in its highest activities. It is related to it as what is fundamental and primary is everywhere related to what is secondary and accessory. But I cannot forbear a grave and growing fear that the leaders of manual education neglect what Mr. A. W. Richards well calls its thought side, and what Professor Thurston insists must be more and more basal for every kind of practical and industrial training, whether it be liberal or for trades. Machinery must not make the pupils merely mechanical, and the wood and iron work are not the only, and perhaps not the most, educational. Progress now in every modern industry is coming to have more and more a scientific foundation, and is resting more squarely and directly upon knowledge of the laws of nature. Physics, chemistry, biology,

mathematics, and geology supply the universal basis, and every manipulation of matter is a case of applied science. Science is thus to have an ever vaster rôle, and all the leaders of industry must serve an ever longer apprenticeship to science. What we apply of it now is but a small part of that which will later be needed. The preparation of youth for all the practical vocations must be constantly longer, and all the arts are ceasing to be empirical, and becoming more and more dependent upon knowledge of the laws of nature.

From this point of view, I for one believe that our manual-training high-school work is too mechanical; that it does tend a little too much to make joiners and cabinet-makers in its wood side and machinists in its metal work. To be really liberal, the hand must simply be used as an instrument for opening the intellect, and even the imagination, and therefore be predominantly humanistic, if we would avoid defect, and be brought into the closest possible connection with the widest area of vital world-interests. Manual training should not only be more a fore-school for engineers of various kinds, but should at every point be developed in closest *rapport* with physics and the other sciences that minister to it, and should be regarded mainly as a means of widening knowledge and deepening interest in these. Man is a tool-using animal, but all the mechanician's rules should teach him more than to use his tools. On the basis of agriculture and the scores of vocational arts that underlie and condition our modern life can and will be built up a system of education that is more truly liberal and better calculated to make scholars, investigators, and leaders, and give more freedom and initiative, with less pedantry of method, than the world has yet seen. Tools and machines are not educative unless they open the world of thought that these have made. The jack-knife and whittling school, the simplest chip-carving, and repoussé work, are better teachers than all the formal and methodic products of manual schools stimulated by prizes and competitive exhibitions.

There are now two chief kinds of manual training, very distinct in idea, plan, and scope. First, those just described and all others where work is carefully graded as to stages of progress and perfection; where exactness and finish are required; those devised for the sake of tools in the order of difficulty, passing from them to machines; those where great stress is laid upon the order of material worked with — paper, clay, wood, iron, etc. — in all these the finished product is either of no use or of very little, but the models are arranged according to grades

of difficulty, and such utilities as they may have — as for paper-cutters, blotters, picture-frames — are subordinated. At this point one has reached the stage of the dovetailed joint with a miter; or in wood-turning he has come to the goblet; or in forging he has reached the cold chisel, chain-welding, or ribbed handle, the use of the thing made being only slight or incidental.

In the other type of manual training the product is cardinal. Something is made because it is wanted or needed. *Finis coronat opus.* These are not trade schools like the Textile School at Lowell; the watch-making school of the Bradley Institute; the Auchmutty School for plumbing, papering, and bricklaying; but are rather illustrated by a vast variety of institutions, like Abbotsholme, where the best boys in England train to cultivate the soil, care for stock, make their boats, boat-houses, bird-houses, and band-stands; the Hampton, Pratt, and the Clark Institution at Atlanta, with twenty-three industries, where students quarry stones, cut oak, make brick, draw plans, and put up dormitories and other buildings; our own Thompson's Island, etc. These schools, although often for Indians, negroes, or juvenile delinquents, are, I believe, the very best schools in the country, if judged by the annual growth in mind, morals, health, ability, and knowledge of the pupils. The most instructive and interesting points on the educational map today are schools like that of Mr. Roe and the school at Phœnix, Ariz., where Indians teach each other their own industries now in danger of going the way of the lost arts — basket-weaving with all its wondrous skill, birch canoes, moccasins, the pottery of several tribes, bead-work, and tent-making. Often, if not usually, in the history of education, schools devised for the lowest classes of society and all in their interests are gradually usurped by the highest classes and slowly transformed, not in all respects for the better. An inexhaustible wealth of curricula is waiting to be developed, which shall train character, intellect, and will, and be essentially liberal and humanistic, out of industries. Just as sloyd began by attempts to teach Swedish peasant children to make crude utensils, so from the Indian industries alone can and will be evolved curricula as no whit less educative, and with the added stimulus of making things that are both serviceable and salable. But this is a long chapter of arts and crafts which should come elsewhere. It is the genetic, so different from the logical, order. Thus industries arose, and thus the child develops faster who repeats the history of the race with judicious omission and with the most educative processes wisely accented.

In his admirable address[1] President Pritchett well points out the shortcomings of Boston in technical and industrial training as compared with Berlin, and well recognizes the unfortunate proclivity of those who represent manual training in high-school grades to hold aloof from immediate utility and practicality as represented in monotechnic or trade schools, as if this work was something almost contaminating. For myself, I think the manual-training high school of the cabinet-making and smithy type a very inadequate, if not an almost perverted, representation of what truly liberal manual and industrial training ought to be. What has been the mainspring and motive in every step of man's marvelous industrial development from the age of stone, bronze, and iron up to wireless telegraphy? It has been *interest in the product*, and to this the *process* has been absolutely subordinated; but now comes the pedagogue with his supernormalized methodic bias and gives us curricula, some of which are about the purest representatives of form without content that even the pedagogic world can show. No boy ever really puts his head into his work unless he is full from start to finish with the thought and the desire of using what he is making, and to my mind there are few more ghastly products of pedagogic art than the so-called graded models—iron in their inflexibility and wooden in their intelligence—and with the vitalizing idea of utility, and that frem the boy's standpoint, carefully dissected out. Of course, the boys are interested in their tools and machines in a way, but the years they spend in these institutions fall far short of educating the head in proportion to the hand, as should be done, and I believe specific trades would really better train heart, head, hand, and above all *morale*, than do these thin curricula, which are *neither liberal, because they hardly touch science, which is more and more the basis of every industry, on the one hand, nor utility, which is the spring of all industry and trade, on the other, but hover aimlessly between.*

What, then, should be done? I answer, the true goal to be gradually approximated here should be curricularized toy-making for the lower grades of manual training, and this should merge over in the high-school grades to the construction of apparatus illustrating scientific principles. Many tentatives in both these lines have been made in various places, enough to show that the elements of toy and apparatus making can be sufficient far all educational purposes and would, as it were, shunt in myriads of brain cells which are not touched by present methods. Here we need a touch of originality and not blind aping of older institutions in other cities or even abroad.

[1] *Technology Review*, January, 1902.

I have often thought in examining toy exhibitions, of which there are several great and permanent museums in Europe with national congresses, how much could really be taught by them. Many German toys with bugs that flutter and creep; birds that fly, peck, and sing; monkeys that climb and turn somersaults; soldiers that march, stab, thrust, or shoot; boats that go both by wheel and rudder; dolls that walk, gesticulate, say, "Twinkle, twinkle little star," with phonographic apparatus; flowers that open to the toy bee and then spring upon him like the Venus flytrap; balloons that propel and steer themselves; steam-engines that go and then reverse; these are *masterpieces of mechanical simplification.* Some of them illustrate fundamental principles of electricity and magnetism, acoustics, equilibrium, etc., and I believe would have a suggestiveness that would well repay study for my committee and their search for models of things to make in the shop were taught physics and even their algebraic formulæ when they were done. Much help would be found in a few of the best boys' books, like Cassell,[1] Baker,[2] Beard,[3] Routledge,[4] and Pepper.[5]

Closely allied to this a competent and open-minded committee would be sure to find interesting suggestions in the literature of magic, especially in the books of Hoffmann and Hopkins, which, like the best toy books, abound in scores and hundreds of things that could be easily made in a manual-training department which could be graded, and which when finished would illustrate scientific principles and give all the zest that the natural boy feels in the implications of superior knowledge which thaumaturgy supplies.

Of course, the chemists should come into such a conference or be represented in a committee seeking to effect this co-ordination. The survey, too, should be wide. Those who have visited the magnificent École du Livre in Paris, where printing, binding, paper-making, and everything about books is taught, would find here new elements of manual training; rubber work, hard and soft, so far as I have seen its processes; soldering and plumbing, as exemplified in Mr. Tower's admirable little book; certain elements that Mr. Hammil, of Baltimore, has proven practicable; and a little library of books like R. S. Baker's

[1] *Book of Outdoor Sports and Indoor Amusements.*

[2] *The Boys' Book of Inventions.*

[3] *What to Do and How to Do it; American Boys' Handibook.*

[4] *Science in Sport Made Philosophy in Earnest.*
Discoveries and Inventions in the Nineteenth Century.

[5] *The Boys' Play Book of Science.*

could be utilized. In these ways alone, problems of the lever, balances, the wedge, pulley-fixed and movable, pump, monochords, rods that vibrate, whistles; perhaps tuning-forks, prisms, small lenses which can easily be ground by boys, mirrors, some of the principles of steam and heat conductivity and calorimetry; perhaps some stone work which has been found very practicable at Phœnix; the magic lantern, stereoscope, magnetism, electricity, kaleidoscope, telegraph, etc., could be naturally approached with a full head pressure of normal boy interest.

I will even venture to add a few special things which might be done and made in a manual-training school, and which touch the heart of the physics interest in the boy.

The history of glass work goes back to ancient Egypt and is a very interesting chapter in the history of industrial education. Until nearly a century ago, glass-blowing was often a profession for gentlemen. Its educational value for the hand in training it to work under the guidance of the eye and the brain has always been highly praised. Glass is almost the only thing schoolable, as it requires great time. You can stop work in wood, but here it must be done on the moment like tempering steel. Bolas, Shenstone, and others show us how boys can be trained to make a plain thermometer the first day. The equipment with the stock of tubes, blow-pipe, bellows, and tools occupies hardly more space than a sewing machine and, some devotees, claim should have a place in every household where there are boys or girls. In six lessons, I once took, I learned to drill with turpentine; to use the diamond; to lead cracks; to seal, pierce, and grind both lead and soda glass; make a spirit-level, etc. It is very easy to teach boys to grind small lenses, and with an annealing oven to work in fluoric and other colors; to gauge, clean, weld; do some decorative work; make and grind stoppers; choke or contract the bore; make funnels and joints; to calibrate, and even to make U and spiral tubes, and many pieces of very simple apparatus used for physics and chemistry. At South Kensington deep-sea thermometers are made, and lectures on the history of glass and its manipulations are given, and the manual discipline which can be given thus is compared to that of learning the piano.

Tops of very many kinds are easily made, and these are the open sesame to many of the simpler, as well as of the profoundest, problems in physics. Boys could easily make a plain Maxwell top and record some of the curves of its wonderfully complex gyrations which have not only illustrated, but so illuminated many of the highest problems, such as Professor Klein demonstrated in his remarkable lectures in this

country by its use. Few things so combine the toy interest, so strong in every boy, with scientific insight, or impel so strongly from sense to reason. A graded course in tops alone might lead into the very heart of some of the profoundest questions in physics, and incite curiosity and develop interest in everything that spins or rotates, according to scores of laws and equations from vortexes and possibly atoms, ions and electrons, to worlds and stellar systems. No boy could take a well-devised course in top-making without opening his mind and stimulating his thought in the highest degree, and thereby making the hand an organ of science.

Kites also rest upon a rich soil of native interests and experience. Beginning with the simplest forms that fill the air at the kite season, or when a local fad is at its height, up to kites with attachments, flyers, diverse individual and perhaps fantastic forms; up to the complex series of box kites that at the Blue Hills of Milton, and in many other meteorological observatories, are lifted two and three miles into the air and clouds to penetrate the secrets of the humidity, temperature, changes of pressure, velocity; perhaps even with photographic attachments, etc. *Where work that the boy has made himself with his own hands goes, there his interest follows.* His reading is stimulated; the inner eye back of the retina is opened; and that priceless though semi-conscious education, which is by hints and suggestions, and which is far more rapid and indelible than anything in the memorized and examinable region of the soul, goes on by leaps and bounds. Thus skill with the fingers is harnessed to development of the cerebral neurons, as it should be, and we are working in the depths and not the shallows of the soul. Baden-Powell, Woglom, Hugh Wise, Varney, and others have made a new contact between boy interest and science here that should have consideration.

Photography should be especially examined for its educational features. Among the most interesting educational institutions I have ever seen is that of the Imperial School of Photography, with its magnificent building, in Vienna, where all the processes of reproduction, lithography, lantern slides, and methods of scientific demonstration, as laid down in the well-known text-books of Dolbear, Wright, and Elmendorf, are taught. At least some of the schools of horology, especially that at Besançon, ought to furnish suggestions, with interesting methods of making and testing pendulums, studying sound vibrations, with simple chronometric Verniers, study of springs and methods of synchronization.

Thus, in fine, holding as I do that instruction in physics for high-school grades would gain by being made less exiguously scientific, and with more alloy of practicality and natural interests, and that, on the other hand, manual training still more needs reconstruction in the interests of culture, I think the time has come for a joint committee which should, not excluding chemistry at least, carefully survey the whole field of motor education, and select and co-ordinate therefrom, wherever found, elements which will at the same time develop a more intelligent basis to manual courses, and give more concrete, all-sided interests their scope for physics. Each is suffering for much that the other could supply, and for which, if based upon natural instincts and nascent periods of youth, they would inevitably overlap, and not only supplement but complement each other. Their divorce is a strange and surely transient anomaly in our educational system. Precedents exist, I think, for every step in the correlating processes that would be found wise, and which would bring to the other the new access of interest, and therefore of power and educational progress.

Scientific apparatus is more generic than machines ; some pieces are products of decades, and even centuries, of progressive improvement. Perhaps nothing that man has made is so instinct with reason and science, or such an open sesame to the laws and mysteries of the physical universe. Without a large arsenal of these, every physical laboratory, no matter how splendid, is a monster without a soul. The quality and abundance of these are perhaps the best general test of the professor and the quality of his work, in a high school. The best courses of lectures I have ever attended were in Germany, one of which was in what was well called a theater, where several assistants were employed to adjust the illustrative apparatus which was drawn up through the floor and let down from above and the sides, prepare the demonstrations, and manage the lights ; and, in the other, a large historic element was introduced by demonstrating apparatus. Illustrative devices perhaps might be added to the material chosen from. That the making of the best things selected from this vast field will be a part of high-school training in physics ultimately, I have not a shadow of doubt ; but it may be that physics will have to organize these courses by itself with little help from the representatives of manual training, who in this country are too dominated by sloyd influences.

MANUAL TRAINING IN THE PRACTICE SCHOOL AT THE DE KALB NORMAL.

LUTHER A. HATCH,
Principal of the Practice School in the Normal School at De Kalb, Ill.

IN this article an attempt will be made to give the reader a somewhat detailed account of the work that has been done in manual training in the practice school connected with the normal school at De Kalb, Ill.

It may be well to state at the beginning that no money has been appropriated for carrying on this work. A small amount has been needed. This has been given by those who have been interested in the boys and their work. This is the second year that the work that will be described has been carried on. The total expense for the two years will not exceed $80. This includes all equipment and material.

Fortunately a well-lighted room has been set aside for this work. This room, which is 40 by 50 feet, is so situated that power from the engine may be utilized easily for running machinery in case it should be needed. Thus far the motive power has been muscle. The writer is inclined to believe that this surpasses any substitute that might be provided, especially for boys below the high school. Every school has more or less surplus muscular energy going to waste that might be turned into a resource if properly directed.

The practice school is situated at a considerable distance from the homes of many of the pupils, hence a large number find it necessary to take their luncheon to school. In the first place, the work in manual training was started for pupils who preferred work to play during the noon hour. During the past year the number working in the shop has ranged from fifteen to forty-five pupils. Classes often go to the shop for work during regular school hours, but their attendance is irregular. Most of the work has been done during the noon hour. A number of girls have done work, but this number has been small.

In planning this work the aim has been to allow pupils much freedom. When a boy comes to the shop with definite ideas as to what he wishes to make, and it is probable that he will construct it with a reasonable degree of skill, he is permitted to select material and begin work. Special care is taken by the teacher not to interfere with the

pupil in his work. Suggestions are made to him when he most needs them. He is shown how to handle the tools when he is using them. He is taught to depend upon himself as much as possible. Here he learns that he has resources of his own. He learns that he can think. The boy who is considered dull often surprises those about him by what he can do with tools.

The pupil makes what he wants to make, and what he does not want to make is left unmade. If it is evident to the teacher that what he wishes to make is beyond his ability, then he is told to decide upon something less difficult. He usually decides without help from the teacher. This may not agree with everybody's pedagogy, but it seems to suit the boys, and instead of doing them harm is doing them much good. Too often in the child's school life the teacher's thought is reflected to such an extent in his work that the individuality of the child is crushed out. Here is one place where the child feels that he is free and independent. He is at liberty to go ahead and work out his ideas. True, there are times when his ideas may be wrong, but even in this case it is better that the pupil give expression to wrong ideas that are his own than to ideas that are imposed upon him by the teacher. With his wrong ideas there will be many that are right. Knowing the pupil's idea, the teacher has a basis upon which to work; not knowing it, she is doing a dangerous thing when she assumes the responsibility of being his teacher. It will have to be admitted that by this method of teaching manual training a few boards will be wasted occasionally, but it is believed that gray matter will be saved.

The pupils feel as free in the shop as they do upon the playground. To them the shop is a pleasant resort, a place where they may or may not go as they please. They whistle, they sing, they talk; an onlooker is impressed with the fact that this is a busy hour for the boys, and that time must not be wasted. They have never been disorderly. It is hard to get them to stop work because of their intense interest in it. This interest is keen because of the clearly defined motive that lies back of what is being done.

The pupils are at liberty to use any of the tools that they find in the shop. When the time comes for closing, the tools are put away in their places; the cupboards which contain them are locked; the benches are cleaned, and stray pieces of lumber are put where they belong. The pupils do this and then go to their rooms. During the two years but one tool has been lost.

The question arises, What has been done? The pupils have been

busy along several lines. The shop had to be fitted up. This the pupils did themselves. They have made many things that were needed in the schoolroom. A number of things that have grown out of their school work have been made. They also have made things for themselves and for others at home. In every case there has been a genuine motive back of what has been done. Part of the things that have been made have been crude, but the pupils have done their best. This leads me to say that in passing judgment upon the work of the pupil in the shop there is danger that we shall look too much upon the finished product and leave out of consideration to too great an extent the child. The fact that the child is not able to do skilful work ought not to be sufficient ground for keeping tools from him. Supply him with tools, such as the saw, hammer, plane, chisel, etc., suitable for his strength. Give him a work-bench of the right height at which to work. Then let him work. He will work. What matters it if his work is crude? Ask: Has he wanted to do this? Does he think that he has done something? Strange as it may seem, more depends upon what he thinks than what you think. Has he done his best? Can he do better next time? Is he stronger for having constructed his kite, sled, bird-house, etc.? Does he need to do what he is doing at this time in his life to lead him to realize the latent possibilities that lie within him? If motor response is necessary and it should take this constructive form, then let us have manual training in our schools. If the child does not do as well as we do in his making, let us remember that he is a child.

In order that this article may not savor too much of the theoretical, a somewhat detailed account will now be given of the work.

When we entered the shop there was nothing in it but an old work-bench, a small supply of lumber, and more or less rubbish. After cleaning up the room the boys decided that they would like to make a work-bench. Before this bench could be made several questions had to be answered. They were: By whom is the bench to be used? how high ought it to be? how wide? how long? kind and amount of material to be used? how shall it be made firm? At the outset the use of the saw, plane, try square, and hammer had to be learned. This bench kept the boys of the sixth grade busy for several days. For our purposes it would be hard to make a bench that would serve us better. It is twenty-nine inches high, three feet wide, and sixteen feet long. For vises iron bench screws were purchased for 25 cents each, and the boys made the vises. We have two long benches like the one just

described, and two long tables upon which much of the lighter work is done. Our next need was a place in which to keep tools. We decided to make a cupboard large enough to hold all of the tools. The seventh- and eighth-grade boys did this work. Several questions had to be decided. The principal ones were: How shall the space be divided? How many doors shall we have? How shall they be put on? How shall the space for the saws be arranged so that they will not be dulled by the other tools? Our cupboard is five feet high, three feet six inches wide, and one foot deep. A space is left on the right of the shelves for the saws to stand on end. The design for the top of the cupboard was worked out in the drawing lesson. This was made by a number of girls who were anxious to learn how to use tools. I doubt if the boys could have done better than they did at this piece of work. As our supply of tools increased it became necessary to have another cupboard made.

We needed nail boxes. One was made with two spaces and another with four spaces. The boys had a little difficulty in deciding upon the size, shape, and handle. They had some difficulty in making the first one stand on all four corners. After a little discussion, as well as observation, it became evident that the element of accuracy was somewhat lacking. A little more use of the try square and plane brought better results with the next one that was made.

The boys found it inconvenient sawing boards without saw-horses. They made four that answer our purpose very well. While constructing the saw-horses the need of a tool for measuring angles was felt. One of the boys worked upon this problem for two or three days. As a result we now have among our tools a very handy tool for measuring angles.

A well-seasoned apple limb furnished us with two good mallets. We had no lathe; a carpenter turned them for us. The boys made handles for them and oiled them.

Shelves were made for the work that was not taken from the shop. All work is taken from the shop when finished, if it does not belong there for a purpose. A rack has been made for holding the material that is used in the shop.

A paint table four feet wide and five feet long was made when the need of it became great enough. On top and to the back of this table a small cupboard has been made for holding paint, oil, varnish, glue, shellac, and stains.

Thus far what you have been told about was made for the shop. Dur-

ing the same time a great variety of other things were being made. A set of shelves was made for my office. These have been very useful as a place for keeping books and supplies. They were made of yellow pine, sand-papered and varnished. Several sets of shelves have been made by the boys for different parts of the building. In a number of the rooms there are no tables for books. In several cases shelves one foot wide and several feet long have been fastened to the walls on a level with the base of the blackboards.

Pointers were needed, so they were among the first articles that were made. Trays, and boxes for cards, etc., have been made from time to time. In one room the pupils designed and constructed a dictionary stand. This was made with a shelf below for books and supplies.

While the sixth grade was studying about the cord, a cord of wood, measuring an inch to the foot, was made from part of a dead tree found on the campus.

There are a number of problems in the fourth-grade arithmetic work involving the telling of time and finding the difference in time between two places. To aid in this work a clock face one foot in diameter was made of a half-inch board. The numbers were cut out of paper and pasted upon the face of the clock. The hands were made of wood. The construction of this clock involved the use of the dividers in drawing the circle and in locating the places for the numbers.

One of the fifth-grade boys made a piece of apparatus to aid in the study of the thermometer. It is made to imitate the thermometer. An upright board four inches in width is marked in the same way that the thermometer is marked. A sliding ribbon, partly colored, represents the column of mercury. By use of this an endless number of problems may be given in finding the difference in degrees when two readings of the thermometer are indicated.

While a class was studying the subject of cotton a cotton gin was constructed. The pictures and descriptions that we could secure of gins gave the pupils their ideas. When this had been done by the pupils themselves, they had a clear notion as to how the seed is separated from the cotton.

While studying lumbering in connection with the pineries of Michigan and Wisconsin, the pupils constructed a miniature lumber camp, including the forest, houses, roads, sleds, tools, river, raft, log jam, etc. Sand was used for the soil; pine twigs for the forest; flour for snow; trays filled with water for the river; small branches were sawed

into proper lengths to represent the logs. The sleds and houses were made from logs by the pupils. It is not necessary to state that this enriched materially the pupils' conception of a lumber camp.

While *Robinson Crusoe* was being studied, the pupils built his island on the floor, using rocks and sand. The island was surrounded with glass to represent the ocean. His home and the things that he made and used were then made. During the recitation the pupils met around this island and worked and thought of Robinson Crusoe with his difficulties and problems on his lonely island.

While studying Longfellow's *Hiawatha* the pupils dramatized parts of it. This involved the making of three good-sized tents, a forest of pine trees, a huge rock for the very strong man Kwasind, a canoe large enough to hold three boys, an Indian cradle, leggings, headgears for holding feathers, several tomahawks, bows and arrows.

About fifty looms were made for the pupils in the lower grades for their use in the weaving of carpet.

Without going into further detail it will be evident to the reader that the element of correlation has not been entirely overlooked. While much that follows does not correlate as closely with the school life of the child, nevertheless it unites itself vitally with his life.

Three boys — brothers — spent several days making a chest for tools. Evidently these boys expected tools for Christmas, as this was completed just before that event. It was a pleasure to see these boys united in their work.

The mothers have not been forgotten, for several knife-and-fork boxes have been made for them. These have a partition in the center, which serves as a handle as well as divides the space into two parts, one of which is intended for knives and the other for forks. As the boys acquire skill in the handling of tools, they are given yellow pine out of which to make articles. The younger pupils and those not skilled in the use of tools use white pine.

Several pupils have made cages for pets that they have at their homes. A boy has just completed a kennel for his dog. Another kennel is in process of construction.

While the snow was on the ground the boys and girls were kept busy making sleds. They were made large and strong enough for use. In every case they were painted, and in many cases ironed. Several pupils decorated their sleds with their names. In most cases this was done quite artistically. A girl made a sled for her doll, a boy for delivering his papers. Many were made long and narrow for coasting.

Several problems had to be solved in the making of these sleds: the plan before the work began; how to use the least amount of lumber; how to construct them so as to secure the greatest strength.

Many playthings have been made for the pupils themselves and for younger brothers and sisters. A boy spent about a week making a bedstead for his little sister's doll. The whole thing was the boy's own idea. This bedstead was about two feet long, and the head was about a foot high. The whole was very well designed. He made it of pine, and stained it a walnut color. To go with this he made a swing for the doll and a table for his little sister's tea parties.

Checker and carom boards seem to be in demand by the boys. One boy constructed a center table and laid off a checker board on it. Small tables have been made by many boys and girls. I think that these find a use at home which leads pupils to make them.

One boy spent several days working at a frame to put in a flower-pot for a climbing plant to grow upon. By his work a little beauty was added to one home. I imagine that his attachment for that home has become slightly stronger for having made this. Whatever will make home mean more to a boy is worth undertaking.

One day a boy came to me and said: "Ma has some flowers. I would like to make a table for her flowers." It happened at the time that we had no lumber for him, but it did not take him long to decide what to do. He said: "May I make it if I bring the lumber?" Although he lives nearly two miles from the school, he came the next morning with a board one foot wide and ten feet long. He worked during the noon hour. In less than a week he took the table home. Many times since I have pictured that home, the table, the flowers, the mother, and the boy.

A boy who has a printing press made a box for his type. He evidently had not used tools to any great extent, for the first box that he made would hardly hold type. He was somewhat discouraged. I led him to see the cause of the defects in his work, and showed him how to improve. He made another that was a decided success. In fact, several of the boys took occasion to admire his work and to say some complimentary things to him. I can see that it was a good thing for this boy to do this work.

Some time ago we secured a large hawk. The need for a cage for it was felt, so the boys and girls made one. It is three feet square and four feet high. A frame was made and covered with wire netting. A good roof was made, so that it might be kept out of doors when the

weather was not too severe. The woodwork was given a coat of red paint. The mesh of the wire is small enough so that small birds may be kept in it for a time for study. It is light, so that two pupils can carry it about easily.

A boy came to the shop with a broken rocker. He said it belonged to his mother's rocking chair. He found a suitable piece of lumber and made a new rocker. When stained and varnished it matched the one that he brought very well. Many things are brought in this way from the homes of the pupils to be repaired. A number of articles about the building that have needed repairing have been repaired by the pupils.

A bread box, large enough to hold five loaves of bread, was made by one of the boys as a Christmas present for his mother. It is seldom that more care is taken in the construction of an article than this boy took in making this bread box.

One day two boys were found making swords and daggers of wood. They were very intent upon their work. Upon questioning them as to what they were doing, I learned that they felt that there was a pressing need for these weapons in acting out certain passages from Shakespeare. The more I argued with them, the more firmly I became convinced that what was being made was of value, although at first they seemed to be valueless. The boys became my teachers. How often we find this to be the case! When the work in manual training was first begun, I foolishly thought that the boys would be interested in making little windmills of wood, windmills that would go. I made one as a pattern. As a matter of fact, the boys never took much interest in windmills. However, there were many other things that they did become interested in. This demonstrates the fact that the boy is an independent individual and must be dealt with as such to a great extent, if his individuality is to remain. True, there are certain parts of his individuality that need to be changed. This can be done best by augmenting that which is already there and which bears the right stamp.

Of late some very good work has been done upon writing-desks. A piece of work of this nature requires careful planning and painstaking work to finish it. The making of a desk also offers a great opportunity for originality in design. One pupil worked patiently for two months upon a writing-desk before it was completed. I have one boy who wants to get his writing-desk finished by the time his father completes his new house.

When the kite season came, kites were made. It was a surprise to me to see how many kinds of kites the boys could make. Since the roads have been in good shape several dog carts have been invented. I say invented, because no two are alike, and I have never seen another just like any that the boys have made.

Some work has been done with knives, but thus far the results have not come up to my expectation. This, I think, comes from the fact that the knife is not an easy tool to use. At the same time it is far more dangerous in the hands of young pupils than the saw, plane, chisel, and hammer — tools that, as a rule, are kept from them. Now, this may be looked upon as heresy by those who have had pupils work with the knife and have not put the bench tools into their hands, but this is as it appears to me at present. Not long ago I gave a small saw to a four-year-old boy to see what he would do with it. By the end of the first day he had mastered its use fairly well. The next day he had enough confidence in his ability to execute to lead him to make a bargain with one of his neighbors to help him saw up his woodpile. This boy could not be induced to use a knife. He was afraid that he would cut himself, and he felt sure that he was not old enough to do any work with it.

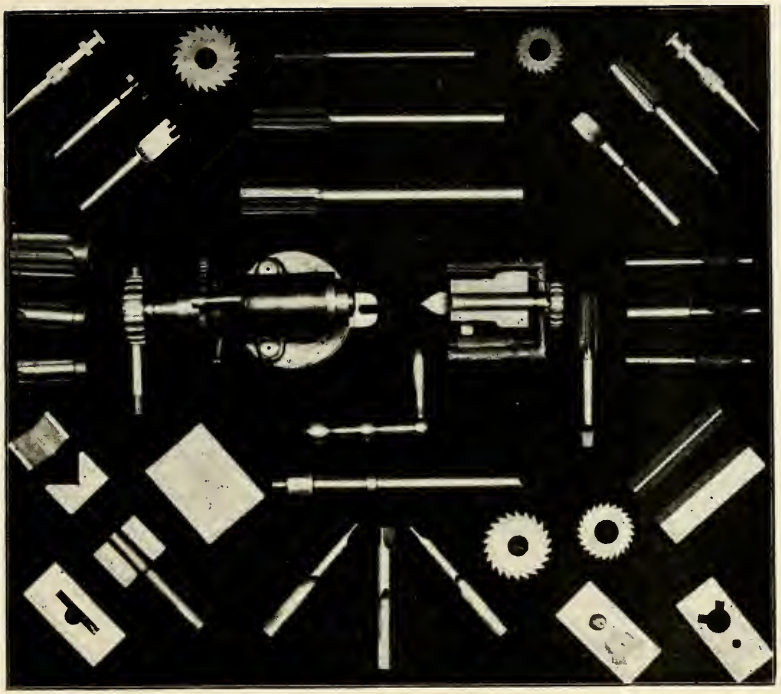
The work in bent iron has proven to be a good form of manual training for the schoolroom. The pliers are the only tools that we have needed. They cost about five cents each. The material used was obtained from a tinner. He cut heavy sheet iron, such as is used for the better quality of stovepipe, into strips one-fourth of an inch wide. These strips were broken into shorter lengths when needed by bending them with the pliers. There is a limitation to this work, but as a basis for mechanical drawing, accuracy in measuring and doing, and as affording an opportunity for originality in making designs, it serves a very good purpose. The pupils like to do this work. What they make is taken home by them.

At present many of the pupils are much interested in a school garden. This involves more or less manual labor. The workshop has proven to be a useful accessory to the garden.

You have been told what we have been doing along the line of manual training. A suggestion has been given you of what we should like to do. Our ideal has not been reached. There are fields in manual training that we should like to enter that have not been considered. Our aim has been to allow the child much freedon in working out his ideas in the shop, in order that he might have an opportunity

to realize his ideal through construction without interference from the teacher. It is thought that by following this plan the child's character will be strengthened. Why? He works independently, and hence has a tendency to be independent. He learns wherein his strength and weakness lie. His thought is objectified so that he may see himself through the thing that he has made. He learns to use means to reach ends that are clearly outlined before him. His will is strengthened by action.

It is evident that, if manual training of this character is to be done, the course in manual training cannot become static. What is to be taught will, in a large measure, be determined by the child's interest.



RESULTS OF TRADE TEACHING IN SPRINGFIELD, MASSACHUSETTS.

ARTHUR D. DEAN.

IT may be interesting to supplement the article published on trade instruction in the April, 1901, issue of the MANUAL TRAINING MAGAZINE by one relating to the growth and present state of the evening trade school now being conducted as a part of the public-school system of Springfield, Mass. The success of this very practical and economical form of trade-teaching has attracted much attention, as it has the distinction of being the only school of trades in America conducted entirely at public expense.

In order to bring out the salient points of the subject chosen, it will be necessary to give a brief history of the school. On the establishment of the Mechanic Arts High School, in 1898, it was suggested

by Dr. Thomas M. Balliet, the superintendent of schools, that the excellent equipment of the school might well be used for the purpose of giving evening instruction in machine-shop practice and plumbing to the mechanics and apprentices of the city who were employed in the various manufacturing concerns, and might wish to qualify themselves for more advanced work. Acting on his recommendation, the school board authorized the opening of classes in the two subjects of machine-shop practice and plumbing. Sixty-one men were enrolled in the classes. A year later the free evening drafting school, which had been in existence for a number of years, was combined with the evening trade work. In the fall of 1900 a class in wood-turning and pattern-making was formed. A small fee of $5 for materials was charged the members of these classes; this operated practically as a guarantee of good faith, the instruction being free. The expenditures the first year, after deducting the incidental fees, were $854, and increased to $1,365.48 for 1899–1900, and $2,195.50 for 1900–1901. The number of students enrolled in 1898–99 was 61; in 1899–1900, 51 in the shopwork and 147 in drafting; and in 1900–1901, 72 in shopwork and 102 in drafting.

Having presented a brief history of the school up to the fall of 1901, I will now describe its courses of study for the past year, give the number of students in each course, and relate a few experiences which bear out the statement that evening trade work is today a phase of school work which is capable of doing much in a manufacturing community to solve certain industrial and social problems.

The school had an enrolment of 337 members who took work in one or more of the courses in mechanical drawing, machine-shop practice, plumbing, woodworking, pattern-making, electricity, and mathematics. The classes opened in October and continued for twenty-one weeks. It might be well to say that the classes in mathematics and electricity were organized at the beginning of the present school year on account of the demand for such work.

The enrolment in drawing was 106 men, divided into three classes — elementary, intermediate, and advanced. The course of instruction covers three years, and consists of two lessons a week of two hours in length. The course is designed to teach mechanics or others the principles and practice of mechanical drawing, in order that they may be able to read and make the ordinary drawings used in the mechanical trades. Fully 75 per cent. of the men in the class apply their mechanical drawing to their daily work. Members of this class

have secured good positions as assistant draftsmen after completing the required work. A considerable number of men can trace their advancement to the training received in the evening drafting classes.

The classes in machine-shop practice and tool-making had an enrolment of 102. Each class met two evenings a week, each lesson being two and a half hours long. The work was divided into three grades: First, those who showed that they had little knowledge of machine-shop practice. These men were given exercises involving simple machine-shop problems, such as filing and turning in speed lathe with hand tools, exercises in filing on hammer heads, clamp-dogs, and templets, exercises involving the use of the drill press, screw-cutting lathe, planer, shaper. Second, those men who classed themselves as machine hands, and wished to familiarize themselves with the processes involved in the making of tools. This grade of work consisted in making milling-machine arbors, gauges, taper and nut arbors, mandrels, reamers and counterbores, milling-machine cutters, and shank mills, bringing in the use of the various milling-machine attachments, grinding machines, and special tools. Third, those men who were skilled workmen, ranking as first-class machinists, and who desired to receive instruction in branches with which they were not familiar, such as the various processes of hardening and tempering, methods employed in making punches and dies, drill jigs and fixtures.

The course of instruction was so planned as to give a working knowledge of the various machines, measuring instruments, and methods used by skilled workmen. There were over 125 applicants for admission to this class. It has been customary to give the preference to men already employed at their trade. Sixty per cent. of the men were engaged in the machinist trade, either as machine hands, apprentices, journeymen, or foremen; while of the remainder the major part were in the allied trades of pattern-making, blacksmithing, or engine repairing. It is a fact that the school has helped many men to increase their wages, and a few to secure employment who were unemployed at the time of their admission to the school.

The class in plumbing had three lessons a week, and consisted of twenty-three members. More than 60 per cent. of the students were regularly employed as apprentices or helpers in the different plumbing establishments. The course aimed to give instruction in the theory and practice of plumbing. One lecture each week was given by the teacher of plumbing on the various sanitary questions connected with the trade. A number of the employers and master plumbers availed

themselves of the privilege granted them to attend these lectures. Several journeymen plumbers have taken the practical as well as the theoretical work. Few changes have been made in the course since its publication in pamphlet form (reference to which was made in this MAGAZINE in a previous issue), with the possible exception of the addition of a course in lead-burning, which, through its popularity this year, will attract some journeymen already qualified in the ordinary methods of wiping joints, who wish to learn this more modern process. At the annual exhibit held in March several interesting booths were fitted up with various appliances used in plumbing. Among these were an automatic cellar drain, a hydraulic ram, flushometer and tank supply, mural tanks fitted with the more common forms of valves, automatic hot-water heaters, and a system of drainage for a three-story house. The students have repeatedly expressed their appreciation of this course, and have said that they can learn to do in the evening school the grade of work equivalent to five years of service under the apprentice system. It is difficult for the apprentices to get much practice in their daily work at their trade on account of the contract and competitive system, which makes it impossible for master plumbers to give instruction and direction for the benefit of the young apprentice. In the evening work the men learn the reasons for doing things in certain ways. Through the course of instruction, which is laid out to give the best possible knowledge of both theory and practice, they come to understand the best modern practice in plumbing.

The class in woodworking numbered twenty-seven, and had two lessons a week of two and one-half hours each. This class was composed of men whose experience had been more varied and whose aims were less definite than members of the other classes; some of them had applied for admission to the machine-shop class, but were rejected on account of insufficient preparatory training. It was thought that these men, after passing through what might be called a manual-training course in woodwork, and having become familiar with hand-tool work, would be able to begin work another year in the machine shop. Apart from this group there were men who were experienced woodworkers, and they took pattern-making. They made some very interesting patterns, among which was a large milling-machine arm, an engine crosshead, different forms of cone pulleys, pillow block and cap, globe valve, steady rest for lathe, and eccentric strap. A great difficulty to be met in the pattern-making class, as well as in the trade work in general, is the insufficient preparation of the men in the read-

ing of the complicated working drawings, such as pertain to the pattern-making trade. It is hoped to obviate this difficulty as the school gains in experience, and insist upon better training in reading drawings, for a pattern-maker must necessarily know how to read drawings and know something about the machinist trade because of his association with it. It has been found essential to bend every energy toward correlating the work in the different trades taught in the school, to try and impress on the students the importance of drawing, of learning to make the necessary calculations, and to bring them to a realizing sense of the value of application of intelligence and industry to mechanical work.

In the development of the school it has been noticed that there appeared to be a need for a broader training for the men than the shopwork alone gave. In the English and German schools for artisans instruction is given in the various academic branches. At the opening of the term last fall two classes were organized in mathematics and one in electricity. The course in mathematics for mechanics included the subjects of arithmetic, algebra, geometry, and trigonometry. Only such phases of these subjects were taught as had a direct application to the mechanical trades. Men who had need of mathematical formulas in their daily work, as well as those who used them mechanically without knowing their derivation, were taught the mathematical principles underlying them. Thirty men were enrolled in these classes. Each class met two evenings a week for two hours. As an outcome of the experience of last year, it has been suggested that a class be formed next year made up of men who are taking up work in the various correspondence schools and who wish to supplement their individual home work by some class work under the direction of a teacher.

Twelve lectures in magnetism and electricity were given during the past year, covering the fundamental principles of these subjects. The registered membership was forty-nine, but the attendance at a number of lectures on subjects of special interest was much larger. The results of this departure were very encouraging, and it is proposed to extend the work in electricity next year by organizing courses in practical electrical measurements and electrical construction.

The per capita cost for last year was $12.36. Each member of the tool-making, plumbing, and woodworking classes was charged $5 for incidentals and breakage. Every year these classes make a number of tools or appliances which become the property of the city and are used in the shops of the day high school.

Certificates of proficiency covering the special lines of work are given to men who acquire the necessary knowledge and skill. Great care is exercised in the distribution of these certificates, as it is intended that they shall have a recognized value in the community.

The total number of men in all the classes who were regularly employed at the trade in which they received instruction in the evening school was 209. It is observed that there were very few students who were not regularly employed as workmen. The school, therefore, was training the men already engaged in the manufacturing establishments, giving them a higher degree of skill and making them more efficient. It has repeatedly been shown that this training has been of great advantage to the men, because they can command higher prices for their work, and it also works to the advantage of the manufacturers because their men are trained to do a better quality of work. There is no part of the public-school system where a dollar goes as far as in this work.

The following tables give statistics regarding age, previous education, per cent. of attendance, and number in each class. Many interesting deductions can be made from these figures taken from the enrolment sheets :

1901–1902.

	Machine Shop.	Mechanic. Drawing.	Wood-turning.	Plumbing.	Mathematics.	Electricity.	Totals.
Average age	24.6	21.9	20.9	23.6	23.4	....	22.8
Youngest member	16	15	14	17	16	....	14
Oldest member	49	43	39	43	40	....	49
Number enrolled	102	106	27	23	30	49	337
Average number belonging	77.3	78	14.7	19.7	16.5	31	237.3
Average attendance	64.6	64.7	12.4	14.8	13.4	25.7	195.5
Per cent. of attendance	80.8	82.4	83.3	75.6	80.3	83.7	80.9

PREVIOUS EDUCATION OF THE STUDENTS.

	Plumbing. Per Cent.	Machine Shop. Per Cent.	Wood-working. Per Cent.
Attended high school	15	25	10
Graduated from ninth grade	30	25	24
Completed seventh grade	55	30	36
Below seventh grade		20	30

THE COST OF MANUAL TRAINING.

II. PRIMARY GRADES.

WILLIAM E. ROBERTS,
Supervisor of Manual Training, Cleveland, O.

IN the introductory article[1] it was stated that the question of equipment was perhaps the most important one in considering the cost of manual training, and that consequently the treatment in this series of articles of the work of the higher grades should be much more complete and suggestive than that of the lower grades. The difficulty of presenting the primary work, from the economic point of view, is again increased by the fact that there is such a wide difference of opinion as to what constitutes ideal manual training for these grades, and that there is such a wide range of materials from which to choose. My purpose, as before suggested, will be to show what is good at little expense and under adverse conditions, rather than what is best with unlimited means and the most favorable conditions.

It is in the primary grades that we find the greatest field for manual training work. This is unquestionably as it should be, for at this period of the child's life manual expression is a much more important factor than in later years. The almost universal introduction of the kindergarten testifies to the practical truth of this statement. It is at this period, too, that the work reaches the greatest number at the least expense, for equipment and material adapted to young children are simple and inexpensive when considered in relation to the returns they give.

In speaking of the cost of manual training for primary grades the question of equipment is relatively unimportant. At the stage of development reached by the child in these grades the hand should be the chief instrument of construction, the work given first emphasizing the use of the larger muscles and groups of muscles and later those which represent finer combinations of muscles, requiring fuller exercise of mental effort to control.

These processes of development call for the use of a wide range of materials, demanding different treatments, which shall tend to develop

[1] The writer feels that the conditions stated in the introductory paper of this series should be carefully considered in the reader's estimate of the articles that follow.

powers in many directions and which shall appeal to and influence many sides of the child's life.

Much can be accomplished with comparatively slight outlay. Clay, color paper, folding paper, drawing paper, construction paper and cardboard, water-color paints, threads for outlining, raffia, reeds and yarns for weaving, and other materials are all more or less inexpensive, and if all cannot be used, from these can be selected abundant material which will be within the reach of the manual training worker. Of course, if economy is necessary, as here implied, we must select materials which are effective but not expensive.

Common potter's clay, reground to give an added fineness of texture, serves well in lieu of more expensive clay prepared especially for kindergarten work. This can be secured in quantity in almost any locality at one cent a pound. If properly prepared and kept in a large jar it will always be ready for use, and the same clay can be used through several successive lessons. In the class the children can work upon their slates, which are easily cleaned, or, better still, a sheet of paper can be provided for each child, and these collected and destroyed at the end of the lesson.

Color papers in pure colors are expensive, ranging in prices from $4 to $15 a ream of 500 sheets, about 20 × 25 inches in size. Dealers will usually include in these prices the cost of cutting the paper into squares or rectangles of the required size, but in any case the cost of cutting is comparatively slight. The color papers provide excellent material for lessons in paper folding, and cutting and pasting of units in design.

It is within the range of paper cutting and folding and paper and cardboard construction work and drawing that we find our greatest possibilities for inexpensive manual training in primary grades. From the almost innumerable qualities, colors, and weights of commercial book papers, cover papers, and wrapping papers most excellent and beautiful material can be selected. A good quality of laid book paper, cut to the required size from sheets 28 × 42 inches, can be purchased at about $4 per ream. This paper has an excellent surface for pencil drawing, and serves well for water-color work. For paper folding common wrapping paper in artistic neutral tones, or the rather more expensive cover papers in light weights can be used, the sheets coming in sizes of 22 × 28 inches, at a cost of about $3 per ream. Heavier gray cover papers of the same size at a slightly greater cost make excellent mounting paper for color work and design. For construction work a

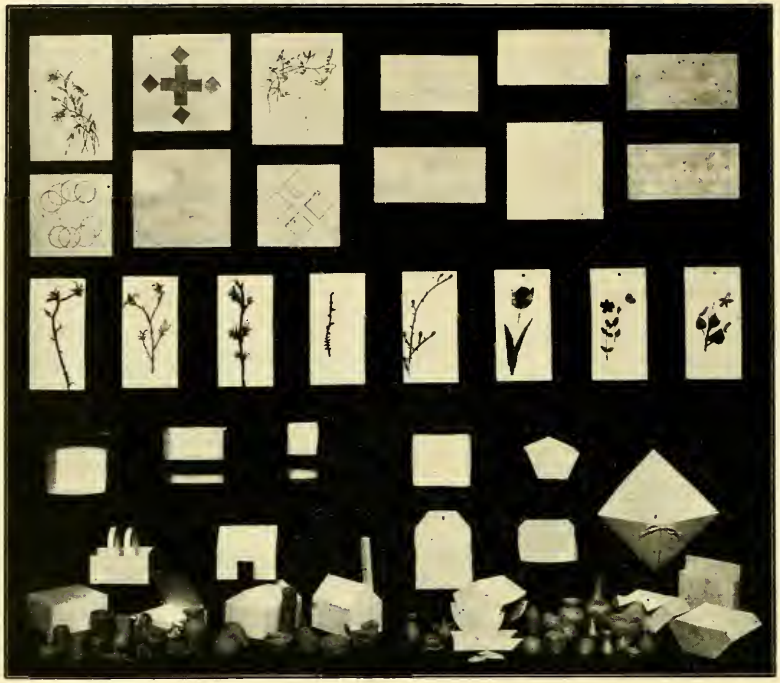
good quality of tag paper is inexpensive. These range in weights for practical use from 100 lbs. to 140 lbs. to the ream in sheets 24 × 36 inches, and cost about three cents per pound. The heavier qualities of cover paper are much more artistic, and of course somewhat more expensive. The best of these can be secured in weights corresponding to the tag paper at about three times the cost for the same quantity. Other beautiful cover papers can be had at lower prices. Most local dealers will cut them into convenient squares and rectangles without extra charge.

Water colors may be made to take the place of the color papers, if not used with them, and serve as a more effective and inexpensive medium for the study of color and design, with the added advantages of providing a broad medium for drawing and of giving a closer relation to other school branches as a means of expression in nature work. Here the cost is governed not so much by the commercial value as by the way in which the materials are used. Our experience has shown us that the expense may be very small, with proper management, less than for the use of color papers. The colors are purchased in small tubes in three primary colors at a cost of seventy-five cents per dozen, in large quantities. A small quantity of each color is placed upon the pallets by the teacher at the beginning of each lesson, and in this way the liability to waste is reduced to a minimum. Excellent individual color boxes are now provided at a cost of from twelve to fifteen cents each. In many cases the children can be required to purchase these boxes for themselves, and the expense of water colors is thus eliminated.

Colored threads and needles used in outlining on tag or on other heavy papers are so inexpensive as to be hardly worth noting.

Raffia, reeds, yarns, etc., for weaving are comparatively new materials in public-school work. They are at present much more expensive than other materials suggested, if they be provided in the proper condition and with proper equipment for use in the schoolroom, and have the added disadvantage of being difficult to handle in large classes where the periods are limited in time.

Very little is actually needed in the way of equipment for the primary grades. A foot rule is found in the school equipment of nearly every child. Scissors are the only cutting instruments required for the work suggested, and a single set of these is all that is necessary for one building, different classes using the same equipment at different hours in the week. Suitable scissors can be purchased at from $1.20 to $1.75

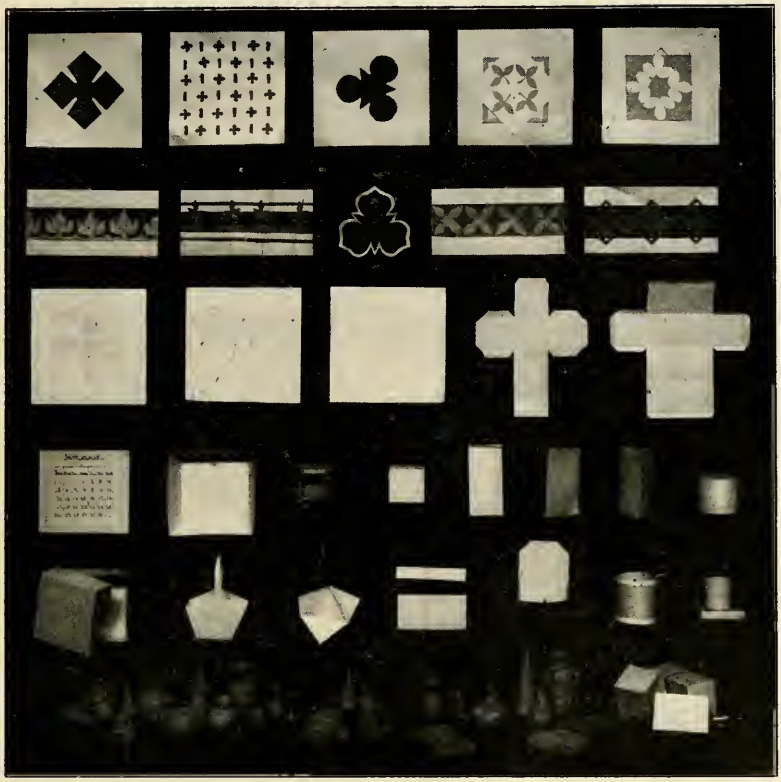


WORK OF FIRST AND SECOND GRADES.

per dozen. In lots of ten gross good scissors can be secured at $1 per dozen. In the same way a single set of equipment for water-color work will serve for one building. Brushes of a good quality suitable for this work can be purchased at thirty-eight cents per dozen, enameled water cups at forty-eight cents per dozen, and enameled pallets at about sixty cents per dozen. If color boxes are used, brushes are provided with each box.

With these materials and equipments, very profitable work can be arranged for the four primary grades. The average cost for supplies alone should not exceed five cents per year for each pupil, and in large cities like our own this expenditure need not exceed three cents per pupil.

The outline for four years of manual training for primary grades given below forms the basis of the work in the Cleveland schools. The time covers thirty-eight lessons, one each week, ranging from thirty minutes in the first grade to forty-five minutes in the fourth



WORK OF THIRD AND FOURTH GRADES.

grade. The work might be roughly divided under three general heads: (1) color, (2) form, (3) construction. The division of time under eachof these heads is about the same, although a glance at the outline will show that the divisions so overlap that they are more imaginary than real. Form and color are emphasized in the earlier grades, while construction is given greater prominence in the later years.

1. *Color.*— By use of the glass prism lead the children to the recognition of color and to the observation of its qualities and quantity in nature. Apply by the use of water colors, color papers, and color threads in design, nature study and construction work.

2. *Form.*— Study form objectively from models of type forms, historic forms, and from nature. Apply by clay-modeling of type and

ornament and nature forms, in paper construction, and by the use of brush and pencil in the study of line and proportion.

3. *Construction.*— Use light and heavy paper and cardboard in folding, cutting, and pasting type forms and useful and ornamental objects adapted to the home, school, and play life of the children.

In the first grade teach the six standard colors only, both in observation and practice. In the form work study the cube, sphere, and cylinder, and the planes derived from them. In construction work omit the use of the rule, limiting all surfaces by folding, and cutting the paper along folded lines.

In the second grade teach, in connection with standard colors, such of the intermediates as are found necessary in descriptive work. Pay much attention to the harmonious use of contrasting colors. Under form study, review the forms used in the first grade and add the hemisphere and simple prism forms. Study more analytically, using geometrical terms in description. Use nature forms in connection with nature study. Give added attention to construction work, using the rule for large dimensions and for ruling and scoring.

In the third grade teach standard tints and shades. Review under form the solids previously used and add the ellipsoid, oblate spheroid, cone, and ornament and nature forms based upon them. Use nature forms in connection with nature study. Give greater emphasis to construction, using heavier material and smaller dimensions, requiring more careful work.

In the fourth grade teach tints and shades and broken spectrum colors. Study form in the review of rectilinear solid forms and in the study of ornament, nature and conventionalized nature forms. Use perspective drawings and working drawings in connection with the construction work.

It might be an interesting side light at this point to note that in our work for the past few years the tendency has been constantly and naturally toward an increase in the relative amount of construction work. This change is a development from the study of the children and from the experience of the teachers. It is suggestive as being in line with the latest manual-training thought.

It has not seemed wise to outline more fully courses of work for primary grades, as such courses would not be governed so largely by equipment as would work for higher grades, and should be adapted as far as possible to local conditions. Suggestions for details of the work can be found in many excellent books and articles upon the different

kinds of manual-training work for primary grades. All of the work here outlined can be taught to large classes, and preferably should be taught by the regular room teacher.

The photographs show some of the simplest results of the work as I have tried to outline it, and are merely suggestive of the almost unlimited possibilities in even so limited a field as that to which I have confined myself.

In subsequent articles I shall take up the work of the lower grammar grades, the higher grammar grades, and possibly the different departments of high-school work.

THE STORY OF CAMP METHUEN.

FRANK FORREST FREDERICK,
Professor of Art and Design, University of Illinois.

ON the crest of a heavily wooded sand dune at Macatawa, Michigan, stands Camp Methuen. Sixty feet above Lake Michigan, reached by a winding walk that threads its way between the trunks of giant beeches, overlooking the treetops to the east and north, and the ever-changing lake to the west, and shut in upon the south by the forest, CampMethuen nestles among the trees the most conspicuous cottage for miles around. This is not because the cottage has gone the colony of summer residences, a half-mile away, one better in a new and startling combination of purple and orange or pink and red paint, or because wood has been tortured into newer and stranger shapes, but because it represents an idea — new in that locality at least — that a summer cottage should be simple, suited to its surroundings, and built (at the smallest possible financial outlay) to suit its purpose. Most summer cottages, unless their cost passes the two thousand mark, are simply partly finished houses, only needing lath and plaster to become sisters to the wooden boxes in which the American people make their homes. Or, the summer home is a shanty with no pretense to beauty or comfort — characterless and ugly. Camp Methuen is as comfortable as its most

pretentious neighbor, and to some eyes more beautiful, while its cost puts it in the shanty class.

Cyclones do not rage in Hispaniola where our fancies run free and easily build summer homes, and we spent the entire winter evolving a most charming cottage. It was a cyclonic day, however, when those plans dropped from Hispaniola into Michigan.

"Fourteen-hundred dollars," said the honest and reliable builder.

"Really?"

"Not a cent less."

Now the land had cost so much, and the furniture would cost so much more, and $550 remained for the house. The difference between $550 and $1,400 would be a mere trifle to any subscriber to this magazine, but to a poor professor, on salary, whose principal asset consists of a large collection of pictures by Frederick which increases, at some expense, far more rapidly than it decreases for little or nothing, it made a difference of no cottage.

But we *had* to have a cottage!

The head of the family, with visions of narrow-gauge piazzas and children shivering around on rainy days, said she must have a big piazza and a fireplace. The general manager, director, and dictator of the family, with visions of rain-soaked canvas, soggy ground, and broken tent ropes, said he must have a floor and a roof. There were other imperative needs which had to be met. Sleeping accommodations for six, and a room in addition for the maid (removed, if possible, from the family), a complete kitchen, and a large living-room, all so arranged as to give a light and airy interior; for the cottage must be comfortable and homelike on hot and cold days, in rain and wind; for all sorts of weather is crowded into the three months of a Michigan summer.

"It can't be done for $550," said the distinguished architect consulted. It was not, it must be admitted, but Camp Methuen stands complete, with the requirements above mentioned, at a cost of but $10.32 in excess of the appropriation, which was doing fairly well for a citizen of Illinois without an architect's license.

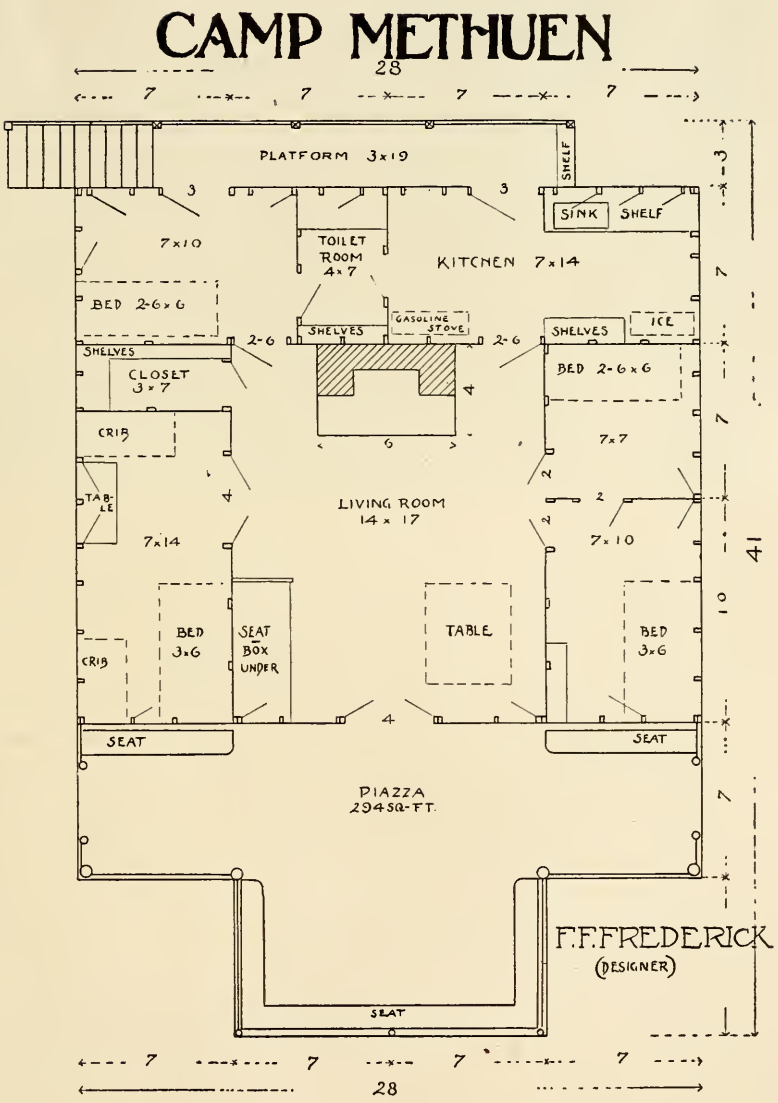
But we are getting ahead in our story.

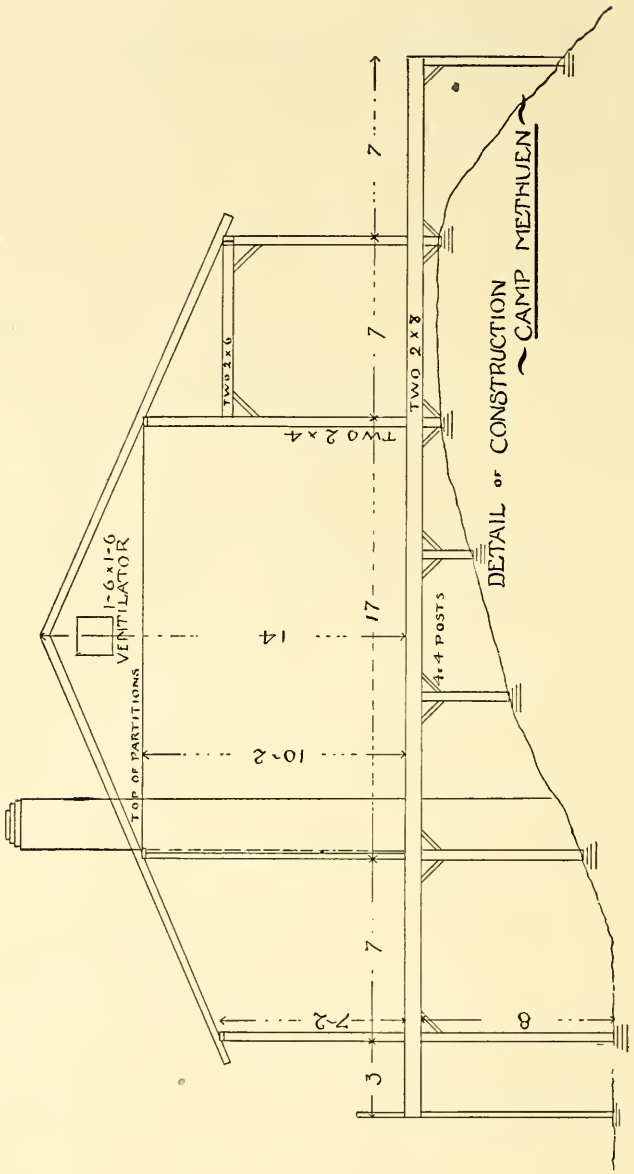
It was evident that the usual and accepted style of house, and ordinary methods of construction, could not be followed if so much was to be done for so little, and so the problem was approached as if

this was to be the first summer cottage ever erected — an experiment in a new and untried field. What are the essentials of a summer cottage and what can be dispensed with? Do we give undue prominence to unnecessary features, and can we do without some things previously, but wrongly, thought necessary to our comfort? Roof, floor, piazza, and fireplace are essentials. A large, pleasant, and well-lighted living-room, and a suitable kitchen, are essentials, but the kitchen need not be large. Sleeping-rooms are necessary, but who spends many waking moments in a bedroom of a summer cottage when there is all of God's outdoors to stay in? The discovery that a bedroom need be but seven feet square made Camp Methuen possible! There is no reason why the human figure should require thirty-six square feet of mattress upon which to woo Morpheus, when it will be just as comfortable upon eighteen or even fifteen square feet, and, accordingly, single beds, so called, logically followed the decision to build small bedrooms. A room seven feet square, or seven feet wide, allows space for a three-foot bed and one or two additional pieces of furniture. With a shelf or two in the corner, and a row of hooks upon the wall, what can anyone ask for — especially when hammocks and chairs await one upon the piazza, and the grand old trees all but touch the roof with ever-beckoning branches?

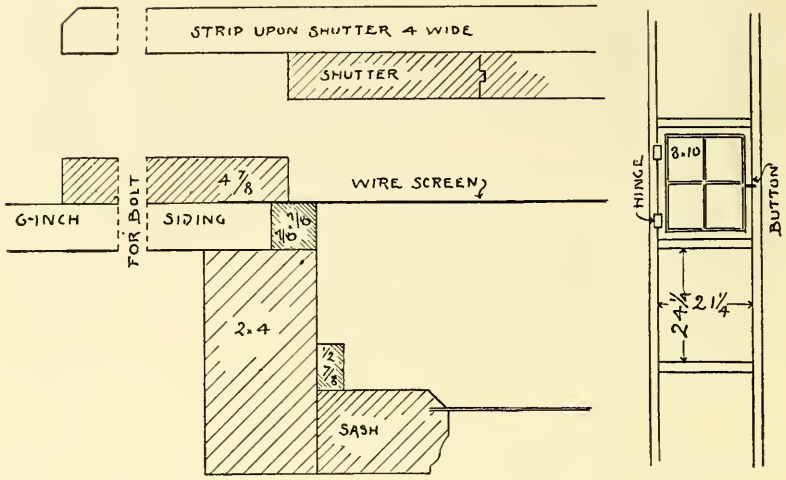
Having once broken the ice of conventional house-planning, it was easy to look at the problem from a new point of view. Stairs and second-floor construction is expensive. The cottage was planned with but one floor and with the simplest possible roof. Door and window frames are expensive; and these were omitted from the specifications. Hardware is expensive. T-hinges and iron latches at eight cents per pair or set were used. Paneled doors are expensive. Batten doors were used at a slight saving in cents, but at a considerable gain in style. Selected face brick, as suggested by the mason, is expensive. The cheapest brick, in that locality a cream color, set up "hit or miss," without pointing, was just the thing. Plastering or clear lumber for ceiling the interior is expensive. The siding, paneled by the studding, made perfect walls. Paint is expensive. Two coats of a greenish brown stain were laid over the entire exterior excepting the roof. In the lights this takes a warm, and in the shadows a cool, tone and becomes a part of the lights and shadows of the surrounding forest. Finish and "gingerbread work" is expensive. Not a foot of lumber not absolutely necessary to the construction was used.

The outside of the siding is undressed, and all of the roof is of


CAMP METHUEN
28
7
7
7
7
PLATFORM 3x19
SHELF
3
3
SINK
SHELF
7x10
TOILET ROOM 4x7
KITCHEN 7x14
BED 2-6x6
SHELVES
GASOLINE STOVE
SHELVES
ICE
2-6
2-6
SHELVES
CLOSET 3x7
BED 2-6x6
4
6
CRIB
7x7
TABLE
4
LIVING ROOM 14x17
2
2
2
7x14
7x10
BED 3x6
SEAT BOX UNDER
TABLE
BED 3x6
CRIB
4
SEAT
SEAT
PIAZZA 294 SQ. FT.
3
7
10
41
7
F.F.FREDERICK
(DESIGNER)
SEAT
7
7
7
7
28


DETAIL OF CONSTRUCTION
CAMP METHUEN
TWO 2 x 8
TWO 2 x 6
TWO 2 x 4
4 - 4 POSTS
1-6 x 1-6
VENTILATOR
TOP OF PARTITIONS
7
7
7
3
14
17
10-2
7-2
8

undressed lumber. The piazza posts are cedar fence posts, the rafters simply notch upon the plate and project fourteen inches. There is a general air of the up-to-date, constructive furniture, and all things seem to be in keeping with the type of cottage. "How this would have delighted William Morris," several have said. Thank the shade of Christopher Wren, no one has yet said, "How rustic!" A separate room for the dining table would occupy a large area of the available floor space, and so we have no dining-room. The table stands in a corner of the living-room, and upon pleasant days is wheeled out through the two 2 × 6 ft. 6 in. doors, each containing six 9 × 14 in. lights, upon the 294 sq. ft. of piazza. At the ends of the piazza and upon three sides of the unroofed projection are solidly built seats of plank. When the table is pushed into the projection and the shadows of the overhanging branches play upon it, and the breaking waves upon the shore provide music, this dining-room is not to be exchanged for anything Newport's finest "cottage" can offer. On cool evenings, when the big lamp is lighted and placed upon this table, where books have taken the place of bread and periodicals of plates, when a fire crackles upon the hearth, and the day's canvas, upon a nail on the wall, looks, perhaps, not quite so bad as it did in the open, then the summer camper feels that life — simplified, but not made uncomfortable — is well worth living.



CAMP METHUEN WINDOWS

By close planning, our carpenters left us hardly enough chips and scraps for a fire in the fireplace. This was made possible by using seven feet as the unit throughout the house. Fourteen feet is a convenient length for lumber, and by placing the studding, both for walls and partitions, with great care, no lumber was wasted. This care in placing the studding was necessary, as the doors and windows are hinged directly to them, thus doing away with frames and saving thereby $53. Barn sash, having four 8 × 10-inch lights, were used for the windows. By placing the studs exactly 20¼ inches apart, and fitting horizontals above and below each sash exactly 24¼ inches apart, the sash needed to be dressed but slightly to fit. As may be seen from the drawing, any desired grouping of windows may be made. In Camp Methuen there are two groups of four sash, several groups of two, several placed singly, as over the kitchen shelf, and on either side of the front door there are three placed vertically. These groups of windows, swinging inward, are very picturesque and give a touch to the cottage that reminds one of the cozy interiors of some old English cottages. The writer cannot lay entire claim to the invention of this method of window construction, as it is but a development of a similar use of sash made by Mr. Ralph Clarkson, the portrait painter, in his summer home at Oregon, Ill. But as we both hail from the Merrimac valley, I fancy we will not quarrel over the

royalties accruing from this invention. It should be explained that, after the siding is in place, and the ⅞-inch strip fitted, and the wire netting tacked on, the 4-inch strip surrounding the window should be secured by screws, so that it may be easily taken off when renewing the screen. Quite the most important feature of the cottage are the ventilators in the gables. These are eighteen inches square, hinged at the bottom, and arranged to open and shut by means of cords. The inside partitions, of 6-inch matched pine, are ten feet high, and this allows a free circulation of air overhead.

The contour of the ground gives room for a large basement for storage purposes. A corner of this (entrance seen in sketch of south-east corner) makes one of the pleasantest rooms in the house.

The $560.32 was expended as follows: hardware, $7; staining, $31; plumbing and tinwork, $31.53; fireplace and chimney, $38.40; builders, $452.39. The work of the carpenters, in addition to the usual construction, included boxes, shelves, seats, etc., not usually found in the summer cottage, but these take up less space than furniture, are more economical, and are more in the spirit of the house. All of the lumber had to be hauled ten miles and the bricks twenty-two, the last two miles over a very hilly woods road, and this materially added to the cost; but the cottage to the owner, at least, is well worth all the time, labor, and money expended upon it.

We amateurs must not forget that much of our success, when perchance we win a morsel, is often due to the skilful help and the practical experience of those we employ to assist us. The builders of Camp Methuen had the spirit of true craftsmen. They had not heard of the arts and crafts movement or of manual training, but, after their first surprise that a cottage a little different from the ordinary was to be erected, they entered into the thing with the spirit of the owner, made valuable suggestions, solved problems, and worked with the eagerness that always comes to the artist when his hand endeavors to express what his mind at last clearly sees.

It is all very well to have the fun of designing these things, but it would be a great satisfaction to be able to build them.

ASSOCIATIONS.

EASTERN ASSOCIATION OF PHYSICS TEACHERS.

THE thirty-third meeting of the Eastern Association of Physics Teachers was held at the Massachusetts Institute of Technology in Boston on May 24. The subject under discussion was "The Correlation of Manual Training and Physics." The opening address was delivered by President G. Stanley Hall of Clark University. This address is printed in full on pp. 189–201 of this MAGAZINE.

In introducing the first speaker, President Clement C. Hyde of the association called attention to the great loss of energy in education, due in part to a high degree of specialization without corresponding correlation. He pointed to the importance of physics teachers knowing more about the problems of related branches of study — especially manual training — and then announced that the work begun at that meeting would be carried on during the next few months by a committee appointed by the association.

After Dr. Hall's address the president introduced Mr. J. M. Jamison, of Pratt Institute, who also spoke in favor of correlation. He said that the teachers in each of the high-school subjects know too little about the other subjects being taught in the same school; they have too little sympathy with the type of information the other subjects convey, and the opportunities for development which they afford. "Teachers of English know too little physics; teachers of mathematics too little physics; and teachers of physics too little English and manual training."

Mr. Jamison was glad that physics is classed among the difficult studies, but he did not believe in making the study uninteresting or disagreeable. On the contrary, interest on the part of the pupil is of primal importance, and this can be aroused by showing the connection of the knowledge and power gained in study with his life-interest. Manual training may help to this end.

In speaking of the mutual sympathy and appreciation which there should be between manual-training teachers and teachers of physics, he said: "The necessity each is under of dealing with large forces, with practical things, and of coming frequently in contact with the business world, creates greater community of interest and tends toward greater openness of mind. Because of this, and because of the many points at which manual training and physics impinge, we might reasonably anticipate a large gain for the school and pupil through proper unification of the teaching in these subjects."

MANUAL-TRAINING METHODS NEEDED IN PHYSICS.

"This gain may come both from the actual application of the information, interest, and power acquired in one subject to the pursuit of the other, and from the mutual exchange of ideals which it brings about. But from the point of view of the physics teacher, I am inclined to think the gain that may accrue to the pupil through the construction of specific pieces of apparatus, or from interlinking the information or training acquired in one subject with the work of the other, great as these may be, are

inferior to the results which have already come and are still coming from an adaptation of methods. The change from the old text-book method of instruction in physics to the modern laboratory course, from memoriter work to the idea of learning by doing, is coming about largely as a result of the recent agitation, which may be termed the manual-training movement. Physics — even laboratory physics — was in danger of becoming too rigid, of becoming too much research work, of dealing too much with cold, hard, repellent logic, instead of providing stimulus, life, growth. I count it the greatest recent advance in physics-teaching for secondary schools, as well as one of the grandest examples of progress toward the ideal in common-school education, that the physical laboratory today frequently offers, in a large measure, the same sort of opportunities as you manual-training men have set as the ideals of shopwork. And here, to my mind, lies the value of bringing manual training and physics into closer relations. I believe the physics teacher will be really successful in proportion to the extent to which he grasps the possibilities of the application of manual-training ideas to his work. Here lies the way of further improvement in our physics-teaching. We should prize the idea of constructive work — the conception of learning by doing. In such work lie the elements of interest — the happy consciousness of achievement, of victories won — which are needed to incite the boy to the expenditure of energy demanded by a subject like physics. And if we can get the boy consistently to follow out a year's work in physics, we need have no question of its value to him. Physics is not on trial.

"Again, in the plan of work required by the constructive method there is possible an enlarged arrangement of topics and the individualization of work, which are important factors in satisfactory physics-teaching. We should follow in our physical laboratory the type of procedure common to shopwork, each step following naturally after the preceding one, and dependent upon it. And at the same time, after fundamental principles are disposed of, we should make greater recognition of individuality, both of preparation and of ability. In such a scheme a few half-steps, which may mean much to certain slower pupils, may readily be inserted without deranging the general conduct of the work. Other and brighter pupils who omit these may go on with special exercises, and thus get better opportunities for greater development. There is no set limit to that which we may take up in physics."

THE CONSTRUCTION OF APPARATUS.

With reference to the construction of apparatus Mr. Jamison said: "I have to question the value of some pieces of apparatus that might be constructed. I can conceive of a piece of apparatus in which, from the standpoint of the physics, the student may get all out of it, not having made it. However, he certainly would have an added interest in it if he had made it, and that would be an important point in teaching."

The next paper was by Charles B. Howe, of Hartford, Conn. This will be printed in full in some future number of this MAGAZINE.

Mr. Howe was followed by Mr. F. M. Gilley, of Chelsea, Mo., who spoke briefly. He agreed with President Hall's paper, and recommedded glass-blowing as a form of manual training on the ground that it compels action at a particular moment. He also favored work in tempering steel for the same reason. He did not believe many schools were properly equipped to make apparatus, but he did approve of the making of apparatus as it was done a few years ago in the Syracuse high school. In that

school an elementary class met on Friday afternoons and an advanced class on Saturday mornings, the latter "limited in number and selected from those who had special ability in the handling of tools and from those whose work in other lines indicated that they could profitably spend the time." A great variety of apparatus was made.

Mr. Howe stated that this work in Syracuse had been discontinued entirely because it was not considered a success.

Mr. C. W. Parmenter, head master of the Mechanic Arts High School, Boston, was then introduced. He spoke, in part, substantially as follows:

"I must content myself with a few statements, which are scarcely more than dogmatic expressions of opinion. In the first place, all my experience, both in teaching physics and in dealing with the subject of manual training, compels me to believe that there is no manual training which is valuable at all as training which does not call for very careful and thoughtful and earnest study while the boy is doing his work. Now, if that is true, it is essentially necessary that the boy should have the subject placed before him so that he is in a position to study earnestly, thoughtfully, and patiently. That can scarcely be done if he is engaged upon miscellaneous work.

"Second, when the subject is presented by a skilful teacher, with reasonable emphasis upon successful achievement, I have never discovered the slightest evidence of lack of interest on the part of the boy, whether the subject-matter under consideration was a useful model, so called, or a piece of apparatus, or a pure exercise. I am inclined to think that the statement which we meet so often, that interest is aroused in a very large measure by the usefulness of the article, is an assertion which is still in the realm of the unproved. I have no experience which leads me to believe that this is essentially and fundamentally true. I am inclined to think, however, that in general, when the conditions are something like equal, it is best that the boy should be engaged upon what appeals to him as being useful. But I want to emphasize as strongly as I can that I have never discovered, in dealing with large numbers of boys, the slightest lack of interest in the subject-matter presented in the shop, when that matter was presented, as it is universally in the school of which I have charge, by skilful teachers. I cannot believe that it is true that we have not greatly overemphasized the probability of increased interest by the mere usefulness of the thing we have in hand.

"Now, if I got Dr. Hall's view-point, I think it would be true that, if he should undertake to manage a large manual-training high school, he would discover that the great variety of exercises he proposes to introduce would interfere very seriously with the work, and defeat, in a very large measure, the essential purpose for which the manual-training school is organized. Again, teachers, like all other people, have a certain right guaranteed by the Constitution to life and liberty and the pursuit of happiness. Now, I undertake to say that my two instructors in carpentry, who deal with seventy-two pupils the first hour in the morning, seventy-two the next period, and seventy-two the period following, would have neither life, liberty, nor the possibility of happiness, if they were expected to turn out trinkets of all sorts and kinds for the teachers of physics, or what not. I am inclined to think that the very limitations of a great public school make that thing impossible. One thing more. I am wholly in accord with the opinion expressed by one of the speakers a little while ago: the boy's time is too precious; the opportunity we present to him is of such enormous consequence, that it is worse than folly to think of frittering away that opportunity in tinkering upon this, that, or the other thing. That simply is out of the question from the

view-point of the manual-training high school, in my judgment. That is a pure statement of opinion, and I am quite willing to let others, who hold different opinions, hold them.

"Again, there is usually no vital relation between the steps to be illustrated in the making of a piece of apparatus and the principles that we want to bring out, and the use of that apparatus. There is somewhere here a piece of apparatus made in my own school. It has been a very valuable exercise for the particular boy engaged upon it; but if the problem had been, instead of providing something valuable for a particular boy, who was exceptionally skilful, to provide something for the 120 boys, many of whom were not particularly skilful, I think neither the instructor nor myself would be here today to tell the story; it would have been so extremely difficult to do."

The discussion closed with a few words from Mr. R. C. Allen, of the New Bedford high school.— From stenographic notes furnished by LUTHER W. TURNER.

SCHOOL CRAFTS CLUB, NEW YORK CITY.

AT the instance of Dr. James P. Haney, director of manual training in New York city, a society to be known as the School Crafts Club was organized in New York city late in May.

Besides that of Dr. Haney, the names attached to the preliminary notice included those of Associate Superintendent of Schools Edward L. Stevens; Professor Frank A. Manny, superintendent of the Ethical Culture Schools; Professor Charles R. Richards, of Teachers College; Professor Perry, of Pratt Institute; and Messrs. Goodnough, Collins, and Shinn. The notice stated the function of the proposed association to be "the critical discussion of questions immediately concerned with the arts of construction and design as taught in elementary and secondary schools."

The meeting for organization was held at the Hotel Manhanset in New York on the evening of May 28. Thirty-four men responded to the call which had been issued. At the meeting a constitution was adopted which provided for four stated meetings each year, each to be followed by a social reunion. The following officers were then elected: president, James P. Haney; vice-president, Frank A. Manny; treasurer, Walter M. Mohr; secretary, George F. Stahl; committee on program: Charles R. Richards, Walter S. Perry, Walter S. Goodnough; committee on entertainment: Harold Peyser, Arthur W. Richards; committee on admissions: Edward Griswold, Victor I. Shinn, Frank Collins.

In view of the general character of the meeting, a diversified program had been prepared. This was taken up after the election. Professor Perry was to have spoken on "The Minor Arts in the High School." In his absence Mr. Hugh Froelich, of Pratt Institute, developed the subject, dwelling on the desirability of offering to the student in the secondary school a variety of constructive exercises, both that he might become familiar with their manipulation and that he might learn, as it were, "to find himself."

Mr. Victor I. Shinn, of the Brooklyn Manual Training High School, then spoke on "High-School Problems in Design." These, he urged, should, if possible, be related throughout the course to some central thought. As an example he cited "the home," and illustrated his idea by showing on several charts the work which pupils under his direction had done in first planning a house from the standpoint of the designer, with particular study of the relation and spacing of the windows and doors.

Later problems showed details of construction elaborated in carefully thought-out designs. As inspiration for the student the speaker advocated hanging about the drawing-room a large number of charts made up of plates culled from the different applied-arts magazines. These plates he would change as changed the nature of the problems being solved by the classes under instruction. As a piece of applied art Mr. Shinn showed a lace collar which had been designed and completed by one of the pupils of the high school.

Professor Charles R. Richards followed, speaking of "Problems in Constructive Work." In illustration of his remarks on the varied phases of the subject he exhibited a number of pieces of work done by the pupils of the Horace Mann School and by students in Teachers College. These included various forms of looms, leading upward from the simplest type, examples of weaving, basketry, and bent-iron work, together with some interesting vase forms which had been decorated in very simple fashion and had been baked in the college kiln.

Mr. Edward D. Griswold, shop instructor in one of the public schools, spoke on "The Truant and Defective" — detailing the happy results which had ensued in the case of several "incorrigibles" who had been gathered into a special class and given a large amount of constructive work. A number of photographs of the boys themselves, and of the work they had completed, were shown. Mr. Arthur W. Richards, shop instructor in the Ethical Culture Schools, advanced "some suggestions as to shopwork in the grammar grades." The speaker reviewed some of the phases of the constructive work which he has detailed in a previous number of the MANUAL TRAINING MAGAZINE.[1] He urged that this work be made to connect "in a vital manner with those things which the scientist, discoverers, and inventors have been concerned with," and that "shop methods be those of the scientists and inventors, taking the form of problems to be investigated, studied, worked out, rather than things simply to be made." As types of the problems he was prepared to recommend, the speaker exhibited a truss bridge and a water-wheel, both of which he had used as models in class work.

Mr. Harold Peyser, of the public-school workshop corps, closed the program by exhibiting a number of well-designed vases decorated with simple incised patterns. These forms Mr. Peyser had first modeled in clay and had then cast in colored plaster. The colors for the most part were deep green or brown with a dull polish. The forms themselves were strikingly effective and elicited much favorable comment.

The meeting finally resolved into a social reunion, followed by adjournment.

The stated meetings of the club will be held in November, January, March, and May.—*Reported.*

NEW ENGLAND ASSOCIATION OF TEACHERS OF METAL WORK.

THE eighth semi-annual meeting of the New England Association of Teachers of Metal Work met in Providence, R. I., March 28 and 29, 1902. Their sessions were held in the Manual Training High School. Addresses were delivered by Mr. Burlingame, head draughtsman of the Brown & Sharpe Manufacturing Co.; Mr. Dawes, of the same company; and Mr. F. E. Mathewson, secretary of the association. Mr. Burlingame's subject was "Relation of Draughting-Room to Shops." He spoke

[1] See MANUAL TRAINING MAGAZINE, January, 1902.

of the necessity of having such a system that the shop would have confidence in the drawing-room. The speaker then discussed the matter of finish in drawings and advocated the use of a red line where the finish is to appear. There is a constant tendency toward the permitting of the draughting-room to say what shall be done in the shop. It is a fault in the draughting-room, and they should consult the men of practical experience in the shop before going ahead.

Mr. Dawes spoke of the apprenticeship system at Brown & Sharpe's. He said: "The demand today for good machinists is greater than the supply. At the works of Brown & Sharpe Manufacturing Co. a system of apprenticeship is in operation which has been mutually beneficial. Our aim is to give these boys the opportunity to become competent machinists. Since the first apprentice was received by this firm, forty-five years ago, over 300 have served their apprenticeship, and a large percentage of them are engaged today in overseeing, directing, or managing either at Brown & Sharpe's or in other manufacturing establishments.

"Applicants for admission to apprenticeship must be from sixteen to eighteen years of age, physically sound, of good moral character, and have received an education equivalent at least to that required for graduation from the public grammar schools of the city of Providence. The first eight weeks of service constitute a term of trial during which both parties have an opportunity to determine whether they are agreed to continue the apprenticeship for the full term. The term of service is four years, each year to consist of 295 working days of ten hours each. Graduates of the Providence Manual Training High School, well recommended by the principal, may have their term of apprenticeship shortened at the discretion of the company.

"An excellent library is provided at the company's expense, free for the use of all. It contains works on mechanics, history, travel, as well as a good class of biographies and works of fiction. It is well patronized. The boys are encouraged to attend the Rhode Island School of Design and the evening public schools, paying particular attention to draughting and mathematics. There is an organization of the boys, which furnishes a valuable means of cultivating a good spirit. The firm employs one man whose duty is to look after the apprentices, both when in and out of the shop; see that they have fair treatment, proper instruction as to the use of tools; settle any grievances, and see that the boys do not idle away their time. The most noticeable failing about the young technical scholar is that he has no idea as to the commercial value of time. I would advise you to teach the boy how to work rapidly."

Mr. Mathewson's subject was "Art in the Forge Shop." He said in part: "There can be an artistic as well as a practical side to the work in forging. I do not know of any other branch of manual training that so entirely depends on the good judgment of the worker in securing satisfactory results as forging.

"In ornamental work in forging it is desirable that the pieces made be, as far as possible, original designs by the students. Work of this kind cannot be successful unless the boys are thoroughly interested; and unless they are interested, it were better not to try anything of the kind. Most boys are apt to be enthusiastic in making something that they have thought about, and of which they have made the necessary drawings.

"This means that there must be more correlation between the drawing-room and the forge shop. In the drawing-room the instructor should emphasize the necessity of good but simple outlines in the design under consideration. Collections of photo-

graphs of artistic iron work should be made and given to the boys for comparison. Attention should be called to the iron work which may be found in some of our modern buildings."

The association visited the works of the Gorham Manufacturing Co., the William R. Harris Engine Co., the Brown & Sharpe Manufacturing Co., the American Locomotive Co., and the Nicholson File Co. The annual dinner was served to eighteen members and guests. The following were elected to active membership in the association: A. L. Fulkeson, of Lawrence, and F. A. Coupal of Boston; to associate membership: R. H. Smith, of Boston; G. H. Colburn, of Waltham; G. H. Bryant, of Newport; G. F. Weston and M. Dawes, of Providence; A. D. Dean, E. A. Finch, C. H. Wilcox, of Springfield.

The next meeting of the association will be held in Waltham, Mass., during the Thanksgiving recess.— *Reported.*

BREVITIES.

THE latest substitute for the term "manual training" is "chirergonology," coined by John J. Quin, of the Warren, Pa., high school. It is derived from the Greek words χείρ, "hand;" ἔργον, "work;" and λόγος, "science;" liberally translated, the science of handicraft.

GOOD WILL FARM, a unique industrial community for poor boys at East Fairfield, Me., has recently completed a gift-fund of $50,000 for a manual-training plant. Rev. G. W. Hinckley, the leading spirit in this enterprise, and his board of trustees are to be congratulated on their success.

THE Hackley Manual Training School at Muskegon, Mich., has been increased to twice its former size, and is now one of the finest schools of its class in the country. The donor has already paid $250,000 for building and equipment, and will endow the school for $5,000,000. It is open to the youth of Muskegon county free of cost. Others are charged a nominal tuition fee to cover cost of material.— *School Journal.*

THE following official statement, dated May 29, 1902, has been received from Howard J. Rogers, chief of the department of education of the Louisiana Purchase Exposition, St. Louis:

"The subject of the postponement of the exposition to 1904 is now before Congress as an item in the sundry civil bill. There is no opposition to said postponement, and indications are that Congress at this session will enact the necessary legislation to provide for dedication ceremonies on April 30, 1903, and for the opening of the exposition on May 1, 1904."

Mr. Rogers adds:

"This information will be of value to you in determining your possible participation in the exposition, and in modifying your plans if the decision to take part has already been made. We feel that, so far as the Department of Education is concerned, the postponement will be of great benefit, as it will enable the schools and institutions in this country to make their preparation throughout the whole of the school year 1902–3, and will insure the more extensive co-operation of foreign nations."

THE Peabody Normal College at Nashville and the University of Tennessee at Knoxville both announce summer courses in manual training for elementary schools. It means much for education in the South that these centers of influence have recognized the importance of manual training.

TAUNTON, MASS.

MANUAL training was adopted by the Taunton school board last year, and was added to the curriculum in September. Full charge of this department was given to Miss Grace King Peaslee, a graduate of the Sloyd Training School, Boston. During the summer Miss Peaslee fitted out two large rooms in the high-school building, one to be used for a demonstration and lecture-room, the other as a workroom. No expense was spared in making these rooms both comfortable and useful. The workroom is equipped with twenty-one benches, each provided with tools. There are roomy closets for finished and unfinished work, a suitable case for blue prints, racks for lumber, a large table for shellacking, and shelves filled with extra tools. The lecture-room contains the demonstration bench and the chairs for the students. This room gives an excellent opportunity for class talks about the work and lectures on subjects that are of interest to the workers. The walls of both rooms are made attractive by racks filled with models showing the courses followed in many other schools.

Up to the present time the work had been given only to the fourth-class high-school students and to the ninth-grade grammar pupils. The high-school work is elective, and consists of four periods of woodworking and one period of freehand drawing. The course followed has been, for the most part, the Swedish sloyd adapted to the needs of Taunton high-school boys, and enriched by the addition of drawing and wood-carving. The teacher of drawing works in harmony with the teacher of woodworking, and the result is a much larger growth of the boy. The objects made are designed by the pupils, made and carved by them, and finished by them. The ninth-grade work has been along the usual lines followed in other schools by this grade. The boys come to the high school one afternoon each week for their lesson.

Until now there has been but little interest in the work, the people failing to see the educational advantage of manual work. By the aid of an enthusiastic manual-training committee, a few public talks by the teacher, co-operation on the part of the press, and the enthusiasm of the pupils, the work is winning the hearts of the parents and laying a solid foundation for itself among the other studies of the school curriculum.— JOHN C. BRODHEAD.

PORTLAND, ORE.

MANUAL training was introduced into Portland in the early part of 1898, when Mr. W. J. Standley opened a private school-workshop. This branch of education being so little understood, the school had a struggling existence for some months, and it was due to the awakening of the Jewish citizens to the importance of the work that the school survived. In the winter of 1898 the First Presbyterian Church arranged with Mr. Standley to open a night school for the street boys in the roughest part of Portland, which continued until the summer of 1899.

In the fall of 1899 a number of patrons and friends of Mr. Standley held a meeting and organized the Portland Manual Training School, thereby consolidating the work of his private school and the night school in one building. The combined

membership totaled about 230, one-third of this number attending the night school. This institution was absorbed by the Portland Young Men's Christian Association, October, 1901. Among the subjects taught here are the following: carpentry, wood-carving, clay-modeling, electricity, and mechanical, architectural, and freehand drawing.

In the spring of 1900 the Council of Jewish Women equipped a school (non-sectarian), primarily designed for the improvement of the children of European Jewish emigrants. It has a membership enrolment of about ninety boys. The Monmouth Ore., Normal School has added a teachers' course. Mr. Fellows, of the Throop Institute of California, is in charge of the departmet.

In 1899 manual training was adopted in a neighboring military school, with Mr. D. P. Dyer as instructor. The citizens of Astoria, Ore., hearing of the successful results of manual training in Portland, determined to start similar work, but were obliged to abandon it temporarily on account of the illness of the instructor.

The educational board of the Portland public schools are quite favorably disposed to manual training and will adopt it as soon as the financial side can be met. Manual training has formed a strong, healthy root, the people are slowly grasping the real import of the work, and the future looks bright and hopeful.—W. J. STANDLEY.

WASHINGTON, D. C.

THE new manual-training school for colored pupils will be known as the Armstrong Manual Training School, that name having received the approval of the board of education and of the commissioners of the district.

So far as the building is concerned, it is quite worthy to stand as a memorial to the founder of Hampton. If those who are charged with the task of directing the school for which the building provides a home shall draw inspiration from his life and work, and, as he did, shall consecrate their efforts to the work they have undertaken, they may make it fittingly honor the name. They can do this if, like Armstrong, they seek to make of the school an actual opportunity for the greater number of colored boys and girls — if they look for existing conditions and honestly meet them.

It is proposed, therefore, that this school shall be a fitting school and point of departure for as diverse capacities and for as many different kinds of ability as the possibilities of its organization and the legitimate scope of such a school will allow. This latter limiting phrase will be given the broadest possible definition.

During the present year the enrolment has been as high as 135, against a scant dozen in the technical course of the colored high school last year. Added to this number is the enrolment in the business department of the high school, which was transferred to the manual-training school, bringing the total up to about 225. The returns now in indicate a school of over 400 pupils next year.

In general, the courses of study are planned to be similar to those indicated, in the April issue of this MAGAZINE, for the white school. The way is open to the engineering college and to the local normal school. By far the greater number, however, are seeking a different kind of preparation — one which will enable them to avail themselves of existing opportunities for which they have heretofore had no chance to prepare, or only in a way which placed them in a more or less menial attitude at first and gave little or no respect of anything better.

It will be evident, to the manual-training teacher at least, that to prepare these

pupils for dignified positions in lines of profitable employment demanding a fair degree of intelligence and skill, it is requisite that the courses of study and work should be made intensely practical, should recognize actual industrial conditions. Everything must bear upon the main point — the maximum of intelligence and skill obtainable in the allotted time. Individual needs must, in large measure, determine the breadth of the instruction, but in no case need it be so narrow as to merit the name of trade-teaching; the conditions this school seeks to satisfy would not permit that.

The courses of shopwork are of necessity still following, for the most part, the lines previously laid down, but as rapidly as possible modifications will be made which will recognize the more definite aim now in view. In the cooking and sewing, the proper trend has already been given. In the way of additional courses is one having for its object the teaching of the care and management of boilers and engines. While this is likely to become one of the most practical and useful courses in the school, it is not a narrow one, for it comprises work in the shops, mechanical drawing, arithmetic, and English. Now the manual-training and the business departments are under the same management, each can offer opportunities to the students of the other which will be mutually advantageous; a beginning has already been made.

Perhaps from this hurried "Brevity" an idea can be obtained respecting the prospects of an enlarged opportunity for the colored youth of Washington. To those interested it is not a question of providing a different kind of a high school. There are many opportunities for acquiring those accomplishments which ought to indicate culture, but which so often prove shackles for hands which else might find independent work to do. The new school proposes to train those hands, to bring them under the control of a head dominated by reason, by good sense — in other words, to concern itself with the laying of such a foundation in character and ability that from it the individual may — *must* — develop that degree of culture which is his particular birthright.—J. A. CHAMBERLAIN.

BOSTON.

NEW cooking schools were opened during the past year in the following districts: Lowell, with Miss Margaret A. Fay in charge; Horace Mann, Miss Grace D. Bachelder; Bunker Hill, Miss Emily H. Hawes; and Chapman, Miss N. Florence Treat. The cooking school formerly in the Bennett School, Brighton District, was transferred to the new Winship School in the same district, with Miss Agnes A. Fraser in charge. The fitting of the room for cooking in the new Roger Wolcott School is nearly completed. It will be ready for classes in September.

EVENING classes in cooking were held during the winter, two evenings a week, in the Lyman School, East Boston; the Drake School, South Boston; and the Hancock School, at the North End. At the Harvard School, Charlestown, classes were held four evenings a week. While the attendance at all the evening classes was excellent, in Charlestown it was exceptionally gratifying. The pupils of two of the classes were very young girls who left the grammar school and went to work before reaching the grades in which cooking is taught. A third class was composed principally of young women, and the fourth of housekeepers, both young and middle-aged.

IN pursuance of the plans for the general extension of the use of the public schools, the Hancock and Lowell Schools have been open during the evenings of May and June, and instruction will be continued during July. The branches taught thus

far have been cooking, sewing, including millinery, dressmaking, and embroidery, lace-making, and basketry. The school board has decided that each school district shall have, as soon as possible, proper rooms for woodworking and cookery. The schoolhouse commission now has in the architect's hands plans for some eight or ten large schoolhouses, most of which have some provision for these branches of work. A novel feature in one of these buildings is to be the playground on the roof.

AT the May meeting of the Manual Training Club a paper on "Discipline" was read by Mr. W. W. Locke, of Dedham. On the evening of May 17 the club tendered a reception to fellow-workers in and around the city. About fifty enjoyed a pleasant evening, with music, readings, and refreshments. "Shop" was strictly tabooed.

June 17 members of the club accepted the invitation of the officials of the Watertown Arsenal and spent the afternoon in going through the works and examining the testing apparatus.

THE city of Boston is going to operate five summer schools in which handicrafts will play a large part. Besides the customary woodworking and cookery, it is expected that Venetian iron work, cardboard construction, basketry, raffia work, pyrography, sewing (including millinery and dressmaking), embroidery, and lace-making will be taught.

MR. WILLIAM H. STARK, of Denver, will conduct the summer schools of the Massachusetts Civic League.

MISS JOSEPHINE MAY, of Syracuse, N. Y., has received an appointment in Boston. — JOHN C. BRODHEAD.

NEWARK, N. J.

THIS year our summer playground work will be for the first time under the control of the board of education and in direct charge of the superintendent of summer schools. A comprehensive course, adapted to our special needs and environment, is now being laid out, and will include games (free and directed), drawing, painting, clay- and sand-modeling, paper and cardboard construction, raffia work, basketry, and possibly bent-iron work.— ELI PICKWICK, JR.

NEW YORK CITY.

THE Lucas A. Steinam School of Metal Working, recently erected as an annex to the Hebrew Technical Institute, 225 East Ninth street, was dedicated with appropriate ceremonies on March 26. Mayor Low, who was among the invited guests, gave an address in which he spoke highly of the value of industrial education for boys, and commended the generosity of the founder, whom he regarded as a public benefactor. President Roosevelt sent a letter of regret.

The school building was erected by Mr. and Mrs. Abram Steinam, in memory of their son, at a cost of $100,000. It is six stories in height, having a forge shop and foundry on the top floor, the other floors being fully equipped for carrying on other lines of metalwork, woodwork, and mechanical drawing. A spacious auditorium occupies the first floor.

AN exhibition of the work of St. George's Evening Trade School was held May 1 and 2, at the school building, 505 East Sixteenth street. Classes were at work in the various branches of industry taught in the school, embracing carpentry, pattern-making, wood-turning, mechanical drawing, printing, plumbing, elementary manual training, freehand drawing, and pyrography. The specimens of work shown give

evidence of the valuable instruction received by the pupils. There are at present 330 in attendance, and 60 on the waiting list.

This school was established as a trade school in 1892 by the corporation of St. George's Church, Stuyvesant Square, its purpose being to interest the boys and young men of the neighborhood, and give them free tuition in certain branches of manual work, leading to more advanced work in the New York Trade School, or directly to remunerative employment. The *St. George's Industrial Herald*, a monthly paper printed by the boys of the school, is an extremely neat piece of work.

TEACHERS COLLEGE and the Horace Mann School were open to the patrons and friends of the college on the evening of May 26, when the work of the past term and the school and college equipments were on exhibition. The manual-training exhibit was evidently the center of greatest interest to the many guests present. All work of the Horace Mann School was exhibited in the school building, though the manual work of the high school and three of the grammar grades is done in the college laboratories.

Some interesting features of sixth-grade work were miniature drawbridges, pile-drivers, and other mechanical devices made by the boys, and hats made from the raw material and trimmed by the girls. A very effective line of work in the fifth grade consisted of various articles of wood with applied designs in color. The high school showed excellent examples of joinery, forging, turning, and machinists' work, none of these consisting of abstract exercises, as in the old courses, but of finished articles. In the fourth-year work were to be seen such articles as a gyroscope, a level, a turned brass box with nicely fitted cover, and a pair of letter scales.

The completeness of the course, from primary to high school, was noteworthy, showing the progress which has been made in the problem of providing for every pupil such work as shall be at once adapted to his age and ability and of the greatest educational value.

AT the fourth annual meeting of the Eastern Art Teachers' Association, held at the hall of the board of education, April 25, a paper on "The Manual Arts in the Public Schools" was read by Dr. James P. Haney, director of manual training in the boroughs of Manhattan and the Bronx.

Dr. Haney maintained that the child's natural instincts should be recognized as the rational basis for his development. These might be summed up as the desire to communicate, to make, to analyze, and to decorate. The arts, therefore, should be regarded as the central element of the curriculum, and other subjects should be developed from this center with the growth of the child. We should cease to regard manual training, and to speak of it, as a "special" subject. When recognized as a natural and necessary part of the curriculum its permanency will be assured.—WILLIAM F. VROOM.

INDIANAPOLIS.

MANUAL-TRAINING work was begun four years ago in one or two schools of the city, but was not pushed to any great extent for a year or two. With the advent of a new school board and an energetic superintendent we have made considerable progress in the last two years. Our equipment at the present time consists of nine shop centers, scattered throughout the city. These have not been used to the best advantage, owing to a lack in the teaching force, which has numbered three. Next year our teaching force is to be increased to five. With this number we expect to take in all

the seventh-grade boys in the city, with the exception of a few in the schools in the outskirts, whom we hope to take in the following year.

Our work in the colored schools this year has been very successful under the direction of Mr. Stokes, who was formerly a teacher in the regular grade work, but who has proved very efficient in grasping the problems in these schools. A night school in one of the colored schools proved very successful during the winter. Here we had grown men, men of families, who came in the evening to work at making various articles of value to them in their homes. Their last project was the making of large refrigerators, the plans of which they worked out themselves, as well as figuring out their own lumber bills. The value of this school has been established beyond a doubt, and I think the prospects are good for an even larger attendance next year, as evidenced by the interest of the visitors at our "open night," held recently. We were handicapped at the beginning by a lack of benches, but we made our own benches at a cost of twenty dollars for an equipment to accommodate twenty boys.

I am at work now (May 25) raising funds for a vacation school to be held in the two largest colored schools of the city. The work is to consist of sewing, cooking, manual training, and possibly nature study and games.—L. W. WAHLSTROM.

THROOP POLYTECHNIC INSTITUTE.

THE introduction of two-year courses in the normal school—art, domestic economy, and manual training—is felt to be a decided success in every way. Not only are teachers better fitted technically, but more time is given than formerly to practice-teaching and to the study of the application of the various subjects to the several school grades and classes.

Among the new teachers for next year, Mr. Ernest A. Batchelder will direct art and design in the grades. Mr. Batchelder was formerly supervisor of drawing at Adams, Mass., and instructor in the theory of design at the Harvard University Summer School, 1901. He will conduct the courses in freehand drawing and design in the summer session of Throop Polytechnic Institute.

Miss Harriet Howell, a graduate of Pratt Institute, has been called to be director of the domestic-art department. The work in domestic science has so broadened that hereafter Mrs. Grace E. Dutton will give her entire time to directing the work in that department. Miss Howell was for two years a teacher at the Mechanics Institute, for one year at the Emanuel Mission House, Boston, and has been for the past five years the director of domestic art in the Kansas Agricultural College.

CHICAGO.

JOHN C. MILLER, for several years in charge of the woodworking at the English High and Manual Training School, Chicago, has resigned his position to become superintendent of the National Fiber & Cellulose Co., whose headquarters are in Chicago. In this change the school loses one of the strongest teachers of manual training in the city.

THE Chicago Sloyd School and the Chicago Domestic Science Association, which together occupy the top floor of the large office building at 147 Fifth avenue, gave a reception and exhibit recently which brought together a large number of women interested in educational work in Chicago. A feature of this exhibit was a display of some unique and artistic pieces of basketry made by students of the sloyd school.

A FEW months ago a committee of the Chicago Federation of Labor was given

the task of investigating the charge that fads detrimental to the best interests of society flourish in the public schools of Chicago. The investigation was made in schools where such fads were supposed to be most objectionable, and a voluminous report was submitted which has been published widely. The breadth of view, common-sense, and insight displayed by the committee were a surprise to many, the result being that the report has been beneficial to both organized labor and the public schools. We quote a few typical sentences:

"We may not have the experience which enables school directors and stockholders in great corporations to estimate values, but we know that the children of the Washington school can read, write, and spell better than we could at their age; we know that they are capable of attention and of reporting accurately what they see and hear; we know that they are being taught not to pass judgment until they have made examination; we know that they are being trained by methods which lead them to 'utilize accessible means of innocent enjoyment.' Direct observation is the best proof of the value of the instruction."

"It is time we began to discuss methods born of reason and from the standpoint of natural laws."

"No reform was ever effected without the cry that it was visionary, expensive, impracticable, and delusive."

"Is there any reason, then, why the public schools, with their rich educational fund, should not be permitted the refining influences which cause gladness and right doing to go hand in hand with intellectual and physical development?"

"Your committee believes that music, drawing, physical culture, visualizing, sense-training — all that brings out the faculties and gives the child power to think and to do — are economic and desirable."

"It is regrettable that that class of studies made essential by the development of modern industry is being denounced as fads, for, with the extension of machinery, drawing and modeling are absolutely necessary to fit one for the battle of life."

"What we need is the formulation of and adhesion to an educational policy."

ILLINOIS.

THE Rock Island high school is planning to introduce manual-training next year. A room will be equipped for the purpose and placed under the charge of Mr. Kent, the present teacher of physics, who has had some technical training.

THE University of Illinois has a new woodworking shop. It is 70 × 198 feet and can accommodate four hundred students. It is built of red brick with sandstone trimmings, and architecturally is very pleasing.

The University of Illinois now has a flourishing arts and crafts association, of which Miss Alice E. Reed is secretary.

THE annual exhibition of public-school drawings held at the University of Illinois each year is having a good effect on the drawing work throughout the state, but it is of special value to the schools in small towns. There is no competition between exhibits as such, but the best pieces of work are awarded honorable mention by a committee of experts. In this way each child in every public school, great or small, in the state is encouraged to exhibit, and if his work is highly meritorious, he is practically sure of having it recognized. The judges of this year's exhibit, in addition to Professor Frederick, of the university, were Mrs. Hannah J. Carter, of Chicago, and Mr. F. O. Sylvester, of St. Louis.

EDITORIAL.

In another department we publish a report of the first meeting and organization of a School Craft Club in New York city. This appears to be just the kind of an organization that is much needed in several of our larger cities at the present time — a local organization bringing into harmonious working relations the leaders in art work and manual training. We congratulate the president of the club and his co-workers, and wish it the fullest measure of usefulness.

It is a matter of history that manual-training work in this country began in the engineering school, and that its courses were very formal. Gradually it has broadened its sphere and at the same time become more flexible, suiting itself to a great variety of needs and conditions. Likewise art instruction began in the technical art school and in most cases was equally formal. That also has been extended to cover all grades of school work, and has become broader and more diversified in character. As these two branches of school work have spread out, being, as it were, both attached to the same educational trunk, they have intermingled and overlapped to a considerable extent. When this intermingling and overlapping of branches has been conscious, and a wise effort made to bind together adjacent twigs, then have we seen the best results, whether viewed from the standpoint of art or manual training or general education. Why, then, should there not be more of this conscious and organized overlapping?

There are some obstacles tending to prevent this which the School Crafts Club ought to be able to remove, or, at least, help to remove. In the first place, teachers of manual training know too little art, and art teachers know too little manual training. Such an organization, inspiring to further study and work, ought to better this condition. The discussions in its regular meetings also are sure to do much in this direction. In the second place, the angle of vision of some teachers of manual training is so narrow that they see no connection between art and manual training. On the other hand, there are some art teachers who see nothing in manual training but applied art—art-craft work. They have no true conception of the value of the study of the great problems of construction, mechanism, and applied science

as they come up, or should come up, in manual training. To bring together, then, for the discussion of problems of common interest, teachers who approach these problems from different, even opposing, points of view is the function of such a club. Such discussion in a broad catholic spirit cannot fail to benefit education. We hope other cities will follow the example of New York.

Professor John Dewey is to succeed the late Colonel Francis W. Parker as director of the School of Education of the University of Chicago. This appointment was the most natural and logical that could have been made, because Professor Dewey was already at the head of the departments of philosophy and education, and is eminently fitted to lead the thought of a great pedagogical school. By this appointment unification of all the pedagogical work of the university is effected.

A recent action of the trustees of the University of Chicago with reference to the development of the School of Education is the decision to put up the building for secondary work in manual training during the coming year. This will cost about $150,000, and will provide shops and drawing rooms for students of the new secondary school which will result from combining the South Side Academy with the Chicago Manual Training School. This building will also be used for the training of teachers of manual training.

In line with this new development in manual training the university is making plans for the establishment of a school for advanced study in engineering, to be located on the Midway. This school will probably place emphasis on graduate work, thus meeting the present needs of many men who pass through the engineering courses in state universities and technical schools in the West.

REVIEWS.

FOREIGN REVIEWS.

THE February number of the *Blätter für Knaben-Handarbeit*, a German periodical devoted to manual training, contains an article of particular interest to all teachers of the subject. It is written by an artist, not a manual-training teacher, and contains a criticism on the method of teaching manual training in Germany, and shows how constructive work may be done in the spirit of an artist. Under the heading "Art Instruction in the Manual Training School" Herr M. Endelin writes in the following strain:

"The question of art education (the education of an artist, in its broad sense) is at present the center of pedagogical discussions. It has become one of the leading topics of the day. In accordance with the thoughts of Lange, Lichtwark, Jessen, and Hirth on this subject, we are now trying to train the æsthetic powers of the people with the more definite end of social usefulness in view, and to carry out this idea in a practical manner in educational institutions.

"At a meeting of the friends of this movement in Dresden last year a number of the aims that the society advanced as desirable were assigned to the manual-training school for accomplishment. And in fact this school must be considered as a factor of greatest importance, when we speak about artistic training, as it furnishes a certain technical ability necessary for artistic production.

"Unfortunately, however, the manual-training movement has not always furthered this end, although the best intentions have been entertained. This condition is chiefly an outcome of the close adherence to certain traditional forms; I have now in mind in particular the inartistic wood-carvings and the avoidance of the more subtle mediums of artistic expression. The manual-training movement should pay more attention to this feature. It would add to the usefulness of the material both from the technical and the artistic point of view, and would infuse new interest in the manual-training room, by making use of the principles underlying artistic production. This phase of manual training is likely to be introduced in the near future. As soon as the manual-training teachers are convinced that this can be done without yielding any of the present aims of their subject, and without the expenditure of more time, and yet be an educational gain, this artistic element will be introduced. Why should it not be their endeavor to construct models in an artistic spirit and manner, in so far as this method does not interfere with the usefulness of the model? The usefulness of a corner-bracket, for instance, is not diminished, nor the educational value of its construction decreased, rather the contrary, by giving the model the form dictated by modern artistic taste instead of copying an old conventional form. The same applies to all the models made in the manual-training room, to those made of metal, cardboard, or clay as well as to those made of wood.

"I will outline a lesson illustrating the manner in which this artistic element may be introduced in the manual-training instruction under the existing conditions. The object of the lesson will be a matchbox.

"*Introduction to the lesson.*— It is an acknowledged rule, applicable to all artistic production, that the form, construction, and decoration of an object should have a certain intimate relation to the use of the model; the æsthetic effect, in fact, depends upon the degree in which this relation is in evidence. We derive a certain satisfaction in looking at an object the form and decoration of which are fitting. The beauty of an object is conditioned by its usefulness. So it is, both in nature and art. From this we draw the conclusion that the material form and decoration of an object are conditioned by its use and purpose. Thus instruction must not be limited to the copying of an object from a model or making it from a drawing; we should rather discuss with our pupils the end served by the object, and from that try to derive the desirable æsthetic effects.

"*Discussion of the form of the model with the class.*—Today we shall make an object to hold matches. Its place should be beside the door, so that a person can find a match easily when he enters the dark room. How many parts has the match-holder? What form should we give to the back? There are already a number of rectangular objects in the room — as pictures, doors, tables, etc.— so it would be desirable to make this object with curved outlines. We will, however, use the rectangle as the type form. Who will try to draw on the blackboard a sketch within the rectangle forming a possible back for our model? (Several pupils make sketches at the blackboard, and these are discussed in turn.)

"*The decoration of the model.*—What kind of decoration should be employed? As we have said before, this decoration should be in conformity with the use of the article; that is, its use, as far as possible, should be made evident by the decoration. We may decorate by carving or painting. If we paint it, what design is most suitable? We might decorate with flowers, leaves, the moon, etc. Which would be the best? The moon. Which moon? The crescent moon. What else should we draw? Mountain, house, or trees? How do these look at night? What color should we use? etc., etc.

"The tools and the materials should be discussed in the same manner. By this method the pupil will get, not only a knowledge of the artist's way of constructing objects, and a lively interest in art, but he will be led to original constructive work, and can thus participate in the blessings of art."

This article contains nothing absolutely new to us. Our efforts have been directed toward this end for a good many years, although conditions have been such in the public schools that only comparatively slow progress has been made. Nevertheless this article has a certain historical interest to us, pointing out, as it does, the appearance, from without the circle of manual-training teachers, of this new impetus to the increased usefulness of the manual-training school in Germany. Courses of manual training used in the German schools which have come to my notice lately seem to indicate that there is some foundation for Herr Endelin's criticism; but then, I know of no course used in the public schools in this country, nor elsewhere, to which it might not apply. The realization of this ideal, however, cannot be accomplished by an abrupt change of present methods, but as a matter of slow but steady growth it is gradually transforming our methods and courses of study in manual training.

A few statistics regarding manual training in Holland, just received in a letter from A. van Waart, teacher in Schiedam, may be of interest to American teachers.

"Manual training is taught in the public schools and in a number of evening schools. In almost all cases the materials used are clay, paper, or cardboard, and only a few schools in The Hague, Haarlem, and Amsterdam have work in wood. There are no special teachers, the instruction being given by the class teacher. The size of the classes varies from twenty to thirty pupils. The Swedish system is followed in most of the schools, but a few use the Danish system of woodwork. One or two hours per week are given to this instruction.

"The first school in bench work was opened in Haarlem in 1890. A little later manual training was introduced in The Hague. The Manual Training Association has this year been granted 2,200 fr. by the government to establish classes for teachers. Instruction will be given in cardboard construction and claywork to twenty-five teachers, and one course will be given in woodwork to the same number. Courses are given regularly in four of the teachers' seminaries. Manual training has lately also been introduced in the schools of the Dutch Indies."—J. H. TRYBOM.

BOOKS.

Education and the Larger Life. By C. Hanford Henderson, Ph.D. Houghton, Mifflin & Co., Boston. 5 × 8 in.; pp. 386; price, $1.30, *net.*— A book on education that deeply concerns teachers of manual training and yet leads them from well-trodden paths of theory and practice to new fields — to make a large inquiry into education — is a book to be welcomed. Such a book is *Education and the Larger Life*, and any teacher searching for material for renewed activity will be well repaid by reading it.

The author makes clear that our knowledge of life must be formulated into a distinct philosophic idea which is, after all, human experience generalized; then this idea must be expressed in the specific terms of a social purpose; and finally, after the *motif* is determined, a certain definite process, which may be termed education, must be applied. He believes in the unity of man, considers that man's well-being means the well-being of his body, of his mind, of his spirit. His conception of the social purpose of man is the study and pursuit of perfection. It is to be a quest, not for the fabled fountain of youth, but for all that makes for human wealth, for the sound, strong, beautiful, accomplished organism, for the unfolding and perfecting of the human spirit. The practical process toward realizing this social purpose — the acquiring of human wealth — is education. The attainment of this organic wealth means work — work with one's hands, with one's mind, and, above all, to do this work with directness, with sincerity, and with power. The book will appeal to the teacher of sloyd, whose success so largely depends on arousing native internal impulses and strong motives in the child in order that he may have a delight and joy in his work. Through his prominence in manual training, no one realizes more than Dr. Henderson the value of the work; and in the chapter on "Organic Education" he points out that to cultivate the senses is to develop the brain end of them — that it is really mental culture, and not a distinct and separate bodily culture. In his plea for good health, sound and vigorous bodies, he points out that these are the first requisites for making the most of the culture of the senses.

Throughout the book there is woven a philosophy that brings out the great principle of cause and effect, and forces one to realize that it applies to education, and that nowhere is it being carried into better effect than in the kindergarten and the manual-training school. He feels, however, that sometimes these schools do not live

up to their philosophy. They still work too much, as if the process was the major end, and not the worker. He appreciates the fact that these schools have made education an inner process, a self-activity, that they carry out their purpose through the play of the inner impulse. He feels that they are open to criticism in that they do not deal with all that comes under the head of organic education — the health of the pupils, the cultivation of the ear and voice, art expression and verbal expression, leading the pupils toward an appreciation of the higher sentiments. He considers, not only the school process which may last five hours a day, but also the remaining hours of the day — the questions of quarters, sleep, bath, dress, and diet.

The first part of the book is philosophical, and expresses tersely and forcibly his ideal of civilization. The book abounds in striking suggestions about things that one may already know, and know so well, perhaps, as never to think about them, much less to practice them. The latter part of the book is devoted to chapters on childhood, youth, and university life, and treats of the proper processes which will bring about the ideal of wealth — a wealth consisting of beautiful men and women — people of accomplishment, goodness, and power.

There is much food for thought, not only for teachers, but for parents. It is a book to be read, not with that critical spirit based upon narrow school systems, but with that broad, sympathetic interest founded on human experience, human longings, and human needs.

ARTHUR D. DEAN.

Practical Lessons in Architectural Drawing: or, How to Make Working Drawings and Write Specifications for Buildings. By William B. Tuthill. William T. Comstock, 23 Warren street, New York, 1902. 11½ × 7½ in.; pp. 61 + 33 full-page plates; price, $2.50.— This eleventh edition of Mr. Tuthill's book is revised and in part rewritten. It treats in detail: (1) a small frame cottage, (2) a frame house, (3) a brick building, (4) a stone building. It also contains chapters on specifications, and building laws. No book, the plates for which were made one or two decades ago, could be expected to satisfy modern taste in certain details of design. In that respect Mr. Tuthill's book falls short of what one might wish in a book to place before students. On the other hand, the book is full of practical suggestions, and discusses fundamental principles which are not affected by changes in taste. As a reference book it is of undoubted value to teachers giving instruction in architectural drawing.

Studies in Education, Vol. II. Edited and published by Earl Barnes, 4401 Sansom street, Philadelphia, Pa.—The first volume of *Studies* gathered together the results of some of Professor Barnes's work in California between the years 1890 and 1897. This second volume, consisting of ten numbers to be published monthly, beginning with March, 1902, will collect the results of work in England and America between 1897 and 1902. The price of Vol. II is $1.50; single copies, 25 cents each.

No. 1 of this volume contains: (1) "The Development of Children's Political Ideas;" (2) "Political Ideas of American Children;" (3) "Children's Stories and Poetry:" I, "Mere Rhyme;" (4) "Studies in Children's Drawings:" I, "The Boer War;" (5) "Type Study on Ideals:" I, "The Problem, and Work Already Done." The last three of the subjects are continued in the April number, to which is added: (1) "How Words Get Content;" (2) "Ought Children to be Paid for Domestic Services?"

The following have been received:

Proceedings of the Department of Superintendence of the National Educational Association. Report of the Chicago meeting, held February 24–27, 1902.— This report contains several notable addresses, among which are: "Obstacles to Educational Progress," by Professor Paul H. Hanus, of Harvard University, and "The High School as the People's College," by President G. Stanley Hall, of Clark University.

Manual of Cardboard Construction for Third and Fourth Grades. By Charles A. Kunow. Printed by the order of the Board of Education, Los Angeles, Calif., 1902. 6 × 9 in.; pp. 74.

Teachers' Art Club.— A booklet containing the constitution, by-laws, officers, and members of a club organized in New York city, under the leadership of Dr. James P. Haney, for the purpose of promoting art instruction in the public schools.

Illustrated Catalogues.— (*a*) The California School of Mechanical Arts, San Francisco, Calif.; (*b*) The Wilmerding School of Industrial Arts for Boys, San Francisco, Calif.; (*c*) Bradley Polytechnic Institute, Peoria, Ill.; (*d*) Throop Polytechnic Institute, Pasadena, Calif.

Manual Training in the State Normal School of Colorado. S. M. Hadden, Director of Manual Training. Bulletin 5 of Series No. 1; published by the Trustees of the State Normal School, Greeley, Colo. 5¾ × 7½ in.; pp. 36.— This booklet discusses briefly such topics as: principles underlying tool-work, self-expression, order of presentation, interest, reasons for interest, variety of materials, and correlation, and then suggests forms of work for the several grades of elementary, secondary, and normal school work. It is illustrated with line cuts and seven full-page half-tones.

Contributions to Education. Published by the University of Chicago Press, Chicago, Ill. 5⅛ × 7⅜ in.; paper covers.— No. 1, *Isolation of the School*, by Ella Flagg Young; price, $.50. No. 2, *Psychology and Social Practice*, by John Dewey; price, $.25. No. 3, *The Educational Situation*, by John Dewey; price, $.50. No. 4, *Ethics in the School*, by Ella Flagg Young; price, $.25.

Report of the United States Commissioner of Education, 1899–1900, Vol. II.— Chap. xl consists of thirty pages of valuable statistical matter on manual and industrial training.

The Treatment of Defectives. By Dr. M. P. E. Groszmann.— Reprint from the New York *Medical Journal*, of February 1, 1902.

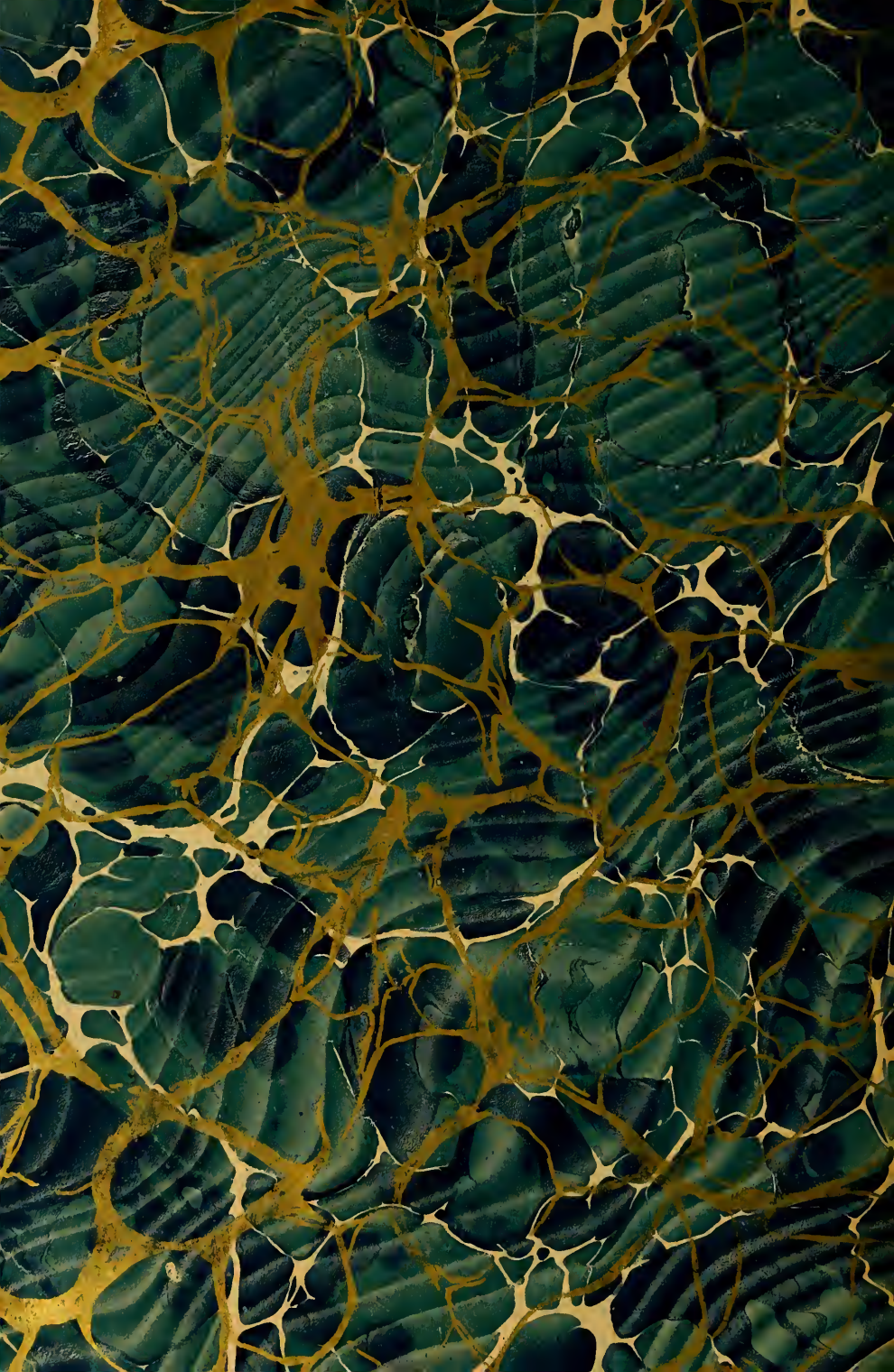
Northeast Manual Training School, Philadelphia, Pa. — Illustrated catalogue for 1901–2.

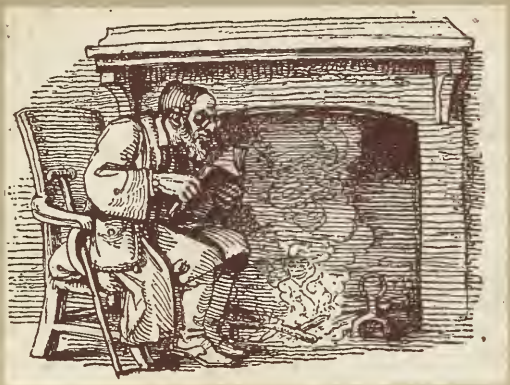
Marienfeld Summer Camp.—A circular of information concerning a summer camp for boys, conducted by Dr. C. Hanford Henderson at Chesham, N. H.

Detroit University School. Illustrated announcement for the third year of this modern preparatory school.

A New High School Building for Stockton, California.—A circular of information inviting architects to submit competitive plans.

Course of Study, Public Schools, Utica, N. Y.—Contains outline of manual-training work for both boys and girls in elementary-school grades 1 to 9.





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